Fujitsu M10-1/SPARC M10-1

Service Manual

Manual Code: C120-E681-08EN
November 2014

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Preface

This document describes the maintenance procedure for Oracle or Fujitsu SPARC M10-1. The maintenance work should be performed by service engineers and/or field engineers.

Fujitsu M10 is sold as SPARC M10 Systems by Fujitsu in Japan.
Fujitsu M10 and SPARC M10 Systems are identical products.

The preface includes the following sections:

- Audience
- Related Documentation
- Text Conventions
- Notes on Safety
- Syntax of the Command-Line Interface (CLI)
- Document Feedback

Audience

This document is intended for service engineers and field engineers who perform maintenance work on the system.

Related Documentation

All documents for your server are available online at the following sites:

- Sun Oracle software-related documents (Oracle Solaris, etc.)
  http://www.oracle.com/documentation/
- Fujitsu documents
  Japanese site

  http://jp.fujitsu.com/platform/server/sparc/manual/

  Global site

  http://www.fujitsu.com/global/services/computing/server/sparc/downloads/manual/

The following table lists documents related to SPARC M10 Systems.

Documentation Related to SPARC M10 Systems (*1)
Fujitsu M10/SPARC M10 Systems Getting Started Guide (*2)
Fujitsu M10/SPARC M10 Systems Quick Guide
Fujitsu M10/SPARC M10 Systems Important Legal and Safety Information (*2)
Software License Conditions for Fujitsu M10/SPARC M10 Systems
Fujitsu M10/SPARC M10 Systems Safety and Compliance Guide
Fujitsu M10/SPARC M10 Systems Security Guide
Fujitsu M10/SPARC M10 Systems/SPARC Enterprise/PRIMEQUEST Common Installation Planning Manual
Fujitsu M10/SPARC M10 Systems Installation Guide
Fujitsu M10-1/SPARC M10-1 Service Manual
Fujitsu M10-4/Fujitsu M10-4S/SPARC M10-4/SPARC M10-4S Service Manual
Crossbar Box for Fujitsu M10/SPARC M10 Systems Service Manual
PCI Expansion Unit for Fujitsu M10/SPARC M10 Systems Service Manual
Fujitsu M10/SPARC M10 Systems PCI Card Installation Guide
Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide
Fujitsu M10/SPARC M10 Systems Domain Configuration Guide
Fujitsu M10/SPARC M10 Systems XSCF Reference Manual
Fujitsu M10/SPARC M10 Systems RCIL User Guide (*3)
Fujitsu M10/SPARC M10 Systems XSCF MIB and Trap Lists
Fujitsu M10/SPARC M10 Systems Product Notes
Fujitsu M10/SPARC M10 Systems Glossary

*1 The listed manuals are subject to change without notice.
*2 Printed manuals are provided with the product.
*3 This document applies specifically to the FUJITSU M10 and FUJITSU ETERNUS storage system.

Text Conventions

This manual uses the following fonts and symbols to express specific types of information.

Font/Symbol	Meaning	Example
AaBbCc123	What you type, when contrasted with on-screen computer output. This font is used to indicate an example of command input.	XSCF> **adduser jsmith**
AaBbCc123	The names of commands, files, and directories; on-screen computer output. This font is used to indicate an example of command input in the frame.	XSCF> **showuser -P** User Name: jsmith Privileges: useradm auditadm
Italic	Indicates the name of a reference manual.	See the *Fujitsu M10/SPARC M10 Systems Installation Guide*.
" "	Indicates the names of chapters, sections, items, buttons, or menus.	See "Chapter 2 Network Connection."

Command syntax in the text

While the XSCF commands have a section number of (8) or (1), it is omitted from the text.
The Oracle Solaris commands have a section number such as (1M) in the text.
Each command has a section number in a command name to prompt users to refer to it.

Notes on Safety

Read the following documents thoroughly before using or handling any SPARC M10 Systems.

- *Fujitsu M10/SPARC M10 Systems Important Legal and Safety Information*
- *Fujitsu M10/SPARC M10 Systems Safety and Compliance Guide*

Syntax of the Command-Line Interface (CLI)

The command syntax is as follows:

- A variable that requires the input of a value must be put in Italics.
- An optional element must be enclosed in [].
- A group of options for an optional keyword must be enclosed in [] and delimited by |.

Document Feedback

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Chapter 1

Before Starting Maintenance Work

This chapter describes the safety precautions that must be observed before starting any maintenance work.
Note the meanings of each of the following symbols and labels to ensure that the work is done correctly.

- Warning/Caution Indications
- Labels/Tags
- Notes on Safety
- Notes on Static Electricity
- Other Precautions
- Emergency Power Off

1.1 Warning/Caution Indications

This manual uses the following conventions to indicate warning and alert messages, which are intended to prevent injury to the user and others as well as damage to property.

Warning - "WARNING" indicates a potential hazard that could result in death or serious personal injury if the user does not perform the procedure correctly.

Caution - "CAUTION" indicates a potential hazard that could result in minor or moderate personal injury if the user does not perform the procedure correctly. This also indicates that damage to the unit itself or other property may occur if the user does not perform the procedure correctly.

1.2 Labels/Tags

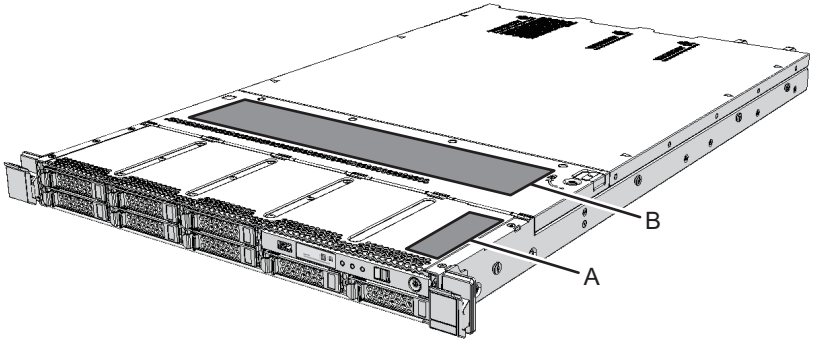
This section describes the labels and tags attached to the chassis.
Observe the precautions of the standard labels attached to the chassis when performing maintenance.

Caution - Do not remove the labels or tags.

Note - The contents of the labels and tags described here may differ from those that are actually affixed to the chassis.

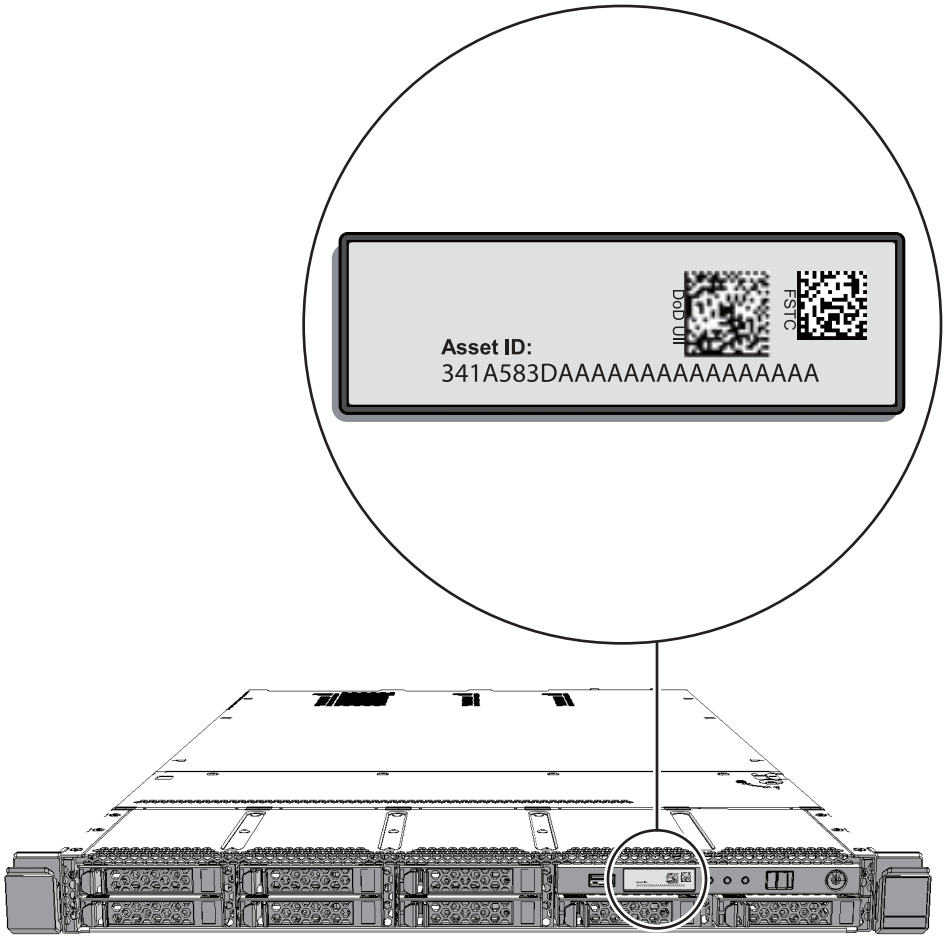
- The system name plate label (A in the figure) describes the model number, serial number, manufacture date, rated voltage/current, number of phases, frequency, and weight required for maintenance and management.
- The standard label (B in the figure) describes the following certification standards.
  - Safety: NRTL/C
  - Radio wave: VCCI-A, FCC-A, DOC-A, and KCC
  - Safety and radio wave: CE, CCC, BSMI, RCM, and EAC

Figure 1-1 Location of the system name plate label and standard label



- The RFID tag carries an Asset ID. The RFID tag is affixed to the operation panel.

Figure 1-2 RFID tag



1.3 Notes on Safety

Observe the following precautions to protect yourself when performing maintenance.

- Observe all the precautions, warnings, and instructions described on the chassis.
- Do not insert foreign objects into the openings in the chassis. Any such foreign object could come into contact with high-voltage circuitry or could short circuit the components, causing a fire or an electric shock.
- Contact your service engineer to inspect the chassis.

Electrical safety

- Confirm that the voltage and frequency of your input power supply match the electric rating described on the system name plate label affixed on the chassis.
- Wear a wrist strap when handling an internal disk, a mother board unit, or other printed boards.
- Use grounded power outlets.
- Do not attempt to make any mechanical or electrical modifications. Fujitsu shall not be responsible for the regulatory compliance of a chassis that has been modified.

Rack-related safety precautions

- Racks should be fixed to the floor, ceiling, or an adjacent frame.
- The racks may be supplied with a quakeresistant options kit. The use of the quakeresistant options kit prevents the racks from falling over when sliding a chassis out on a slide rail, either for installation or maintenance.
- Prior to installation or maintenance, a safety assessment should be conducted by a service engineer in the following cases:
  - When the quakeresistant options kit is not supplied and the rack is not fixed to the floor with bolts: Confirm safety by checking whether the rack could fall over, etc. when a chassis is pulled out on the slide rail.
  - When the rack is to be installed on a raised floor: Check that the raised floor can bear the load when a chassis is pulled out on the slide rail.
- If the chassis is mounted at the 20U level or higher, use a step ladder.
- If multiple chassis are mounted in a rack, perform maintenance for each of the chassis.

For details of the racks, see "Chapter 2 Planning and Preparing for System Installation" in the *SPARC M10 Systems Installation Guide*.

1.4 Notes on Static Electricity

Observe the precautions related to electrostatic discharge (ESD) as described in Table 1-1 to ensure the safety of personnel and the system.

Table 1-1 ESD precautions

Item	Precautions
Wrist strap	Wear an antistatic wrist strap when handling printed boards.
ESD mat	An approved ESD mat provides protection from static damage when used with a wrist strap. The mat also acts as a cushion to protect the small parts that are attached to printed boards.

Table 1-1 ESD precautions *(continued)*

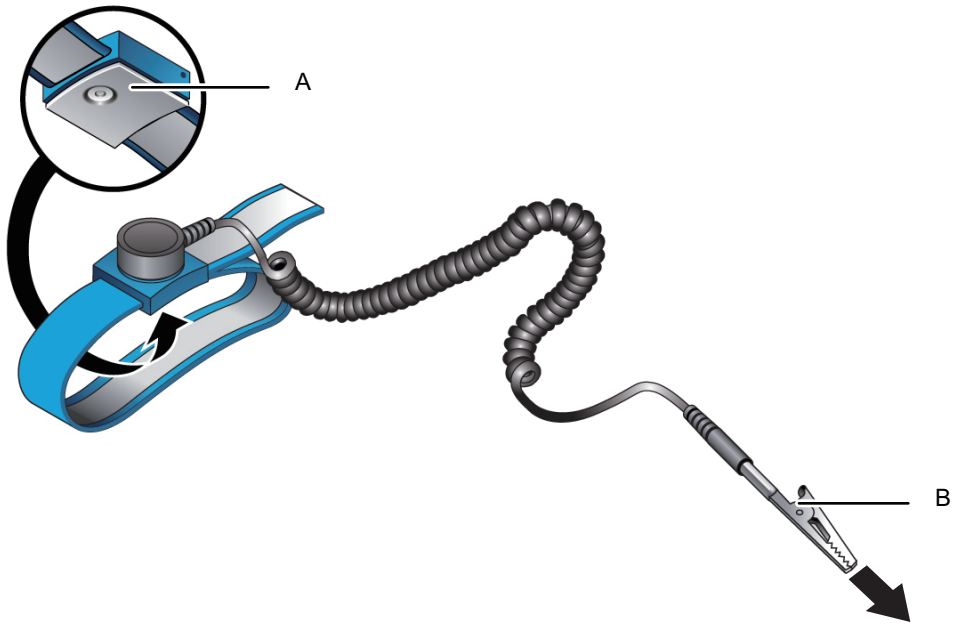
Item	Precautions
Antistatic bag/ ESD safe packaging box	After removing a printed board or component, place it in the antistatic bag or ESD safe packaging box.

How to use a wrist strap

Wear a wrist strap in such a way that the inner metal surface (A in the figure) of the wrist strap band is in contact with your skin. Connect the clip (B in the figure) directly to the chassis.

Caution - Do not connect the wrist strap clip to the ESD mat. By connecting the wrist strap clip to the chassis, the operator and components have the same electrical potential, thus eliminating the danger of static damage.

Figure 1-3 Wrist strap connection destination



1.5 Other Precautions

- The printed boards in a chassis can be easily damaged by static electricity. To prevent damage to printed boards, wear a wrist strap and ground it to the chassis

prior to starting maintenance.

- If excessive force is applied to the motherboard unit, the components mounted on the printed boards could be damaged. When handling the motherboard unit, observe the following precautions:
  - Handle the motherboard unit by holding it by the handle.
  - When removing the motherboard unit from its packaging, keep the motherboard unit horizontal until you lay it on the cushioned ESD mat.
  - Connectors and components on the motherboard unit have thin pins that bend easily. Therefore, do not place the motherboard unit on a hard surface.
  - Be careful not to damage the small parts mounted on both sides of the motherboard unit.
- The heat sinks can be damaged by incorrect handling. Do not touch the heat sinks with your hands or other objects while replacing or removing motherboard units. If a heat sink becomes disconnected or is broken, obtain a replacement motherboard unit. When storing or carrying a motherboard unit, ensure that the heat sinks are sufficiently protected.
- When removing a cable such as the LAN cable, if you cannot reach the latch lock of the connector, use a flat headed screwdriver to push the latch and release the cable. If you use force to remove the cable, the LAN port of the motherboard unit or a PCI Express (PCIe) card may be damaged.
- Do not use any power cords other than those specified.

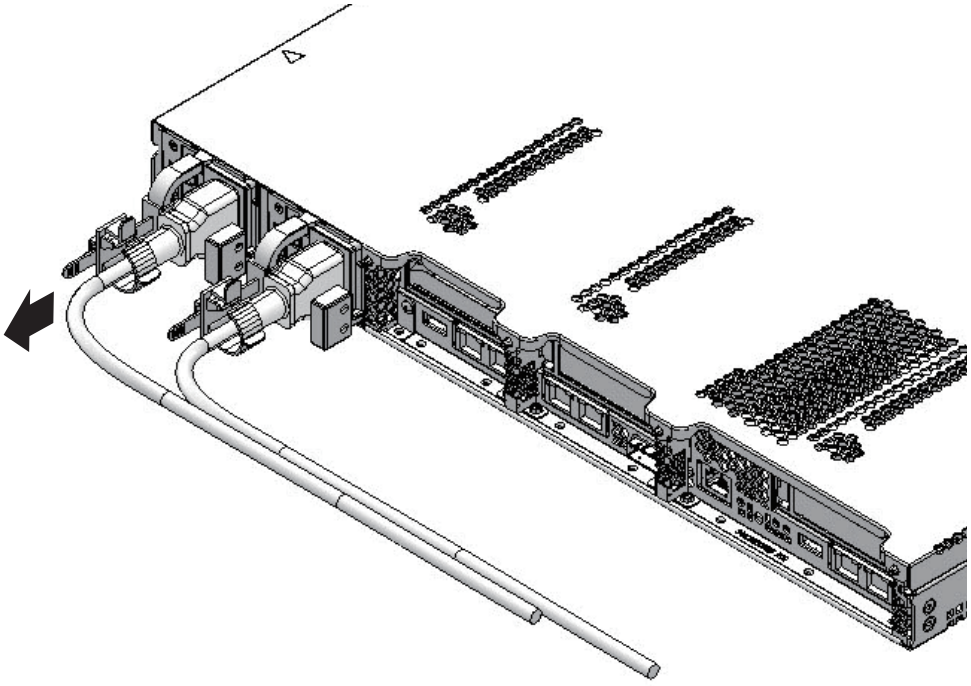
1.6 Emergency Power Off

This section explains the procedure for powering off the system in an emergency.

Caution - In an emergency (such as smoke or flames coming from the chassis), immediately stop using the unit and turn off the power supply. Regardless of the operation you are performing, give top priority to fire prevention.

1. **Remove all the power cords from the power supply units.**

Figure 1-4 Removing the power cords



Chapter 2

Understanding the System Components

This section describes the components mounted on the SPARC M10-1.
It is necessary to confirm and fully understand the configurations of the components mounted in the chassis as well as the LED indications before starting any maintenance work.

- Identifying the Names and Locations of Components
- Confirming the Functions of the Operation Panel
- Checking the LED Indications

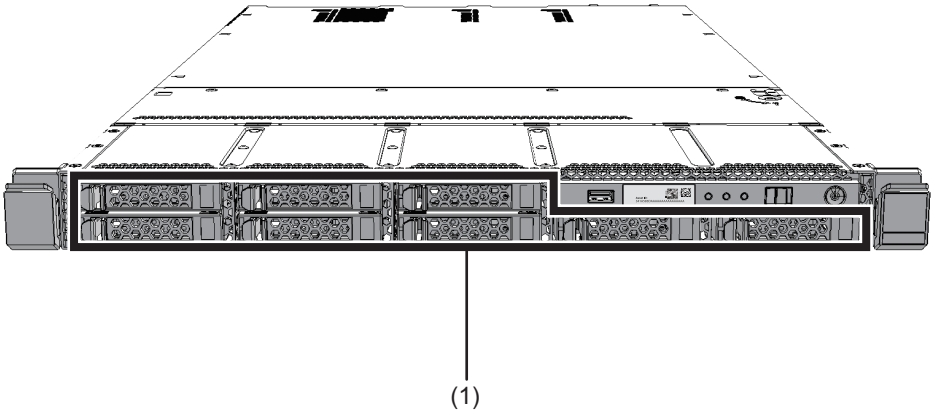
For the specifications of each component, see "Appendix B Component Specifications."

2.1 Identifying the Names and Locations of Components

This section describes the names and locations of the components mounted on the SPARC M10-1.

Components that can be accessed from the front

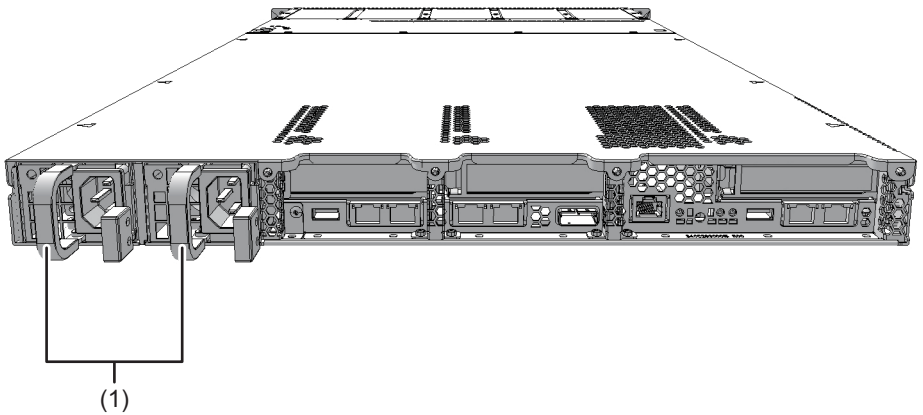
Figure 2-1 Location of components that can be accessed from the front



Location number	Component
1	Internal disk

Components that can be accessed from the rear

Figure 2-2 Location of components that can be accessed from the rear

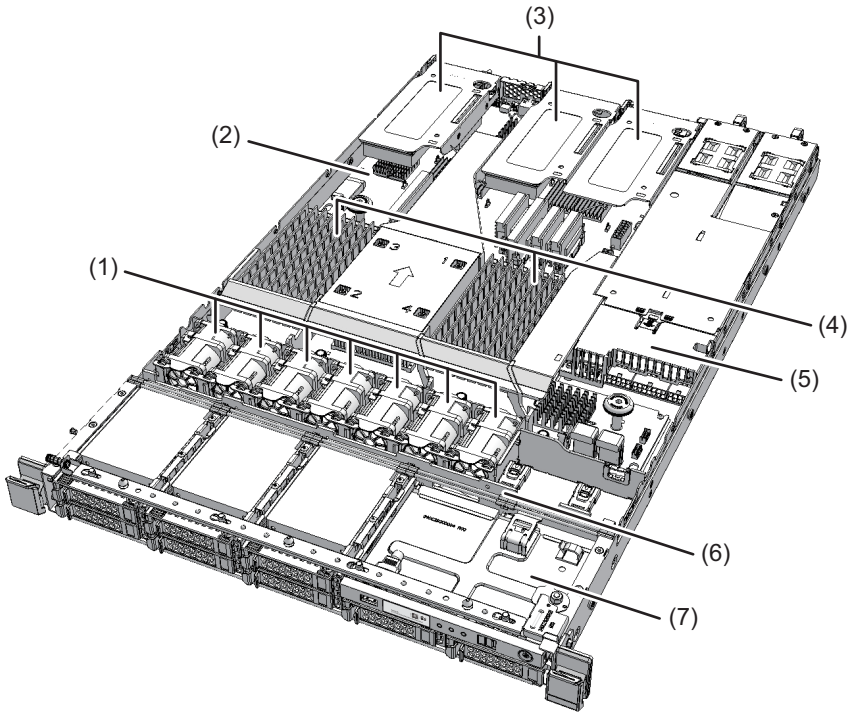


Location number	Component
1	Power supply unit

Internal components

To access the internal components, open the fan cover and remove the upper cover. For details on how to remove the covers, see "5.3.3 Opening the fan cover" or "5.3.4 Removing the upper cover."

Figure 2-3 Locations of internal components



Location number	Component
1	Fan unit
2	Motherboard unit
3	PCI Express (PCIe) card
4	Memory
5	PSU backplane
6	HDD backplane
7	Operation panel

2.2 Confirming the Functions of the Operation Panel

This section explains the functions of the operation panel.
The operation panel provides the system's display and control functions. The field engineer and system administrator can specify the operation mode or control start/stop of the system while checking the LEDs indicating the system operation status.

Figure 2-4 Location of the operation panel

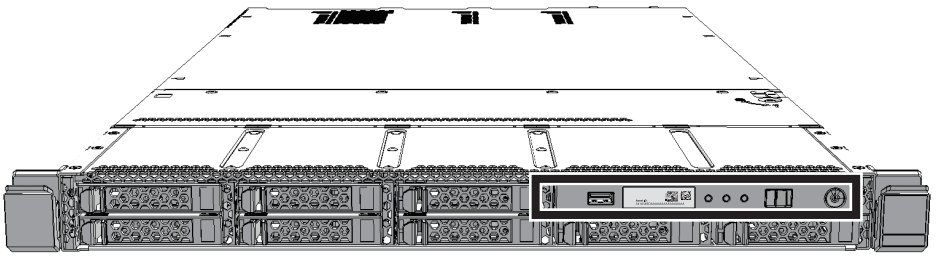
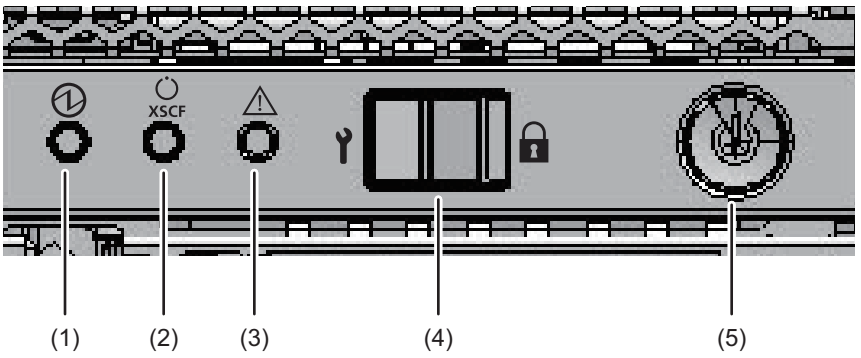


Figure 2-5 Appearance of operation panel



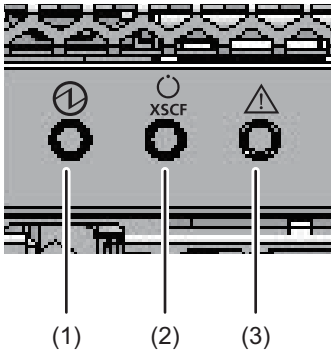
Location number	Component
1	POWER LED
2	XSCF STANDBY LED
3	CHECK LED
4	Mode switch
5	Power switch

2.2.1 Display function of the operation panel

The operation panel has three LED indicators as a display function. The LED indicators represent the following items. For details, see "2.3.1 Operation panel LEDs."

- General system status
- System error warning
- System error location

Figure 2-6 Operation panel LEDs



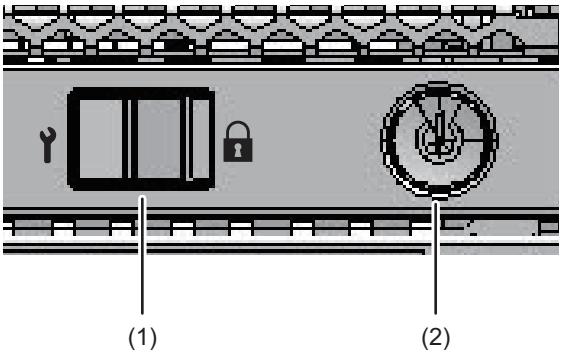
Location number	Component
1	POWER LED
2	XSCF STANDBY LED
3	CHECK LED

2.2.2 Control function of the operation panel

The operation panel has the following switches as a control function:

- Mode switch (slide switch)
  Specifies the operation or maintenance mode.
- POWER switch
  Controls start/stop of the system.

Figure 2-7 Operation panel switches



Location number	Component
1	Mode switch
2	POWER switch

The mode switch sets the operation mode for the system. The Locked and Service operation modes can be switched by sliding the mode switch.
Table 2-1 describes the difference between the modes.

Table 2-1 Functions of the mode switch

Icon	Name	Description
	Locked mode	Mode used for normal operation - The power switch can be used to start the system but cannot be used to stop it.
	Service mode	Mode used for maintenance - The power switch cannot be used to start the system but can be used to stop it. - Place the system in Service mode to perform maintenance work with the system stopped.

Use the power switch to start or stop the system. The system starts/stops differently depending on how the power switch is pressed.
Table 2-2 describes how system starts/stops vary depending on how the power switch is pressed.

Table 2-2 Functions of the power switch

Icon	Operation	Description	
	Brief press (For 1 second or more and less than 4 seconds)	If the system has been started in Service mode:	Operation is ignored.
		If the system is stopped in Service mode:	Operation is ignored.

Table 2-2 Functions of the power switch *(continued)*

Icon	Operation	Description	
		If the system has been started in Locked mode:	Operation is ignored.
		If the system is stopped in Locked mode:	Starts the system. At this time, if a wait time for the air conditioning facilities or a warm-up time is set on the XSCF, the processing for waiting for the power-on of the air conditioning facilities and the completion of warm-up is omitted.
	Long press (For 4 seconds or more)	If the system has been started in Service mode:	Perform the system shutdown process to stop the system.
		If the system startup process is in progress in Service mode:	Cancels the system startup process and stops the system.
		If the system stop process is in progress in Service mode:	Continues the system stop process.
		If the system is stopped in Service mode:	Operation is ignored. The system does not start even after holding down the power switch.
		If the system is stopped in Locked mode:	Starts the system. If a wait time for the air conditioning facilities or a warm-up time is set on the XSCF, the processing for waiting for the power-on of the air conditioning facilities and the completion of warm-up is omitted.
		If the system is not stopped in Locked mode:	Operation is ignored.

Table 2-3 describes the functions of the mode switch.

Table 2-3 Functions of the mode switch

Function	Mode switch	
	Locked	Service
Start/stop of the system by the power switch	Only system startup is enabled.	The system can be powered off by holding down the power switch.
Inhibition of break signal reception	Enabled. Reception of the break signal can be enabled/disabled for each physical partition by using the setpparmode command.	Disabled

2.3 Checking the LED Indications

This section describes the indications given by the system LEDs.
LEDs are mounted on the operation panel on the front of the chassis, on the rear panel of the chassis, and on those components that can be maintained. If an error occurs, the LED indication enables you to determine the system that requires maintenance.

2.3.1 Operation panel LEDs

The three LEDs on the operation panel indicate the operation status of the entire system. In addition, the LEDs enable you to check the system status with the combination of the LED statuses (being on, blinking, or off).
Table 2-4 lists the system operation status as indicated by the LEDs and Table 2-5 lists the system status as indicated by the LED combinations.

Table 2-4 System operation status indicated by LEDs

Icon	Name	Color	Status	Description
	POWER	Green	On	System is started.
			Blinking (*1)	System stop process is in progress.
			Off	System is stopped.
XSCF	XSCF STANDBY	Green	On	XSCF is functioning normally.
			Blinking (*1)	System initialization is in progress after the turn-on of the power.
			Off	XSCF is stopped.
	CHECK	Amber	On	An error that prevents the system from starting has been detected.
			Blinking (*1)	Indicates that the chassis requires maintenance (this function is also referred to as the "locator").
			Off	The system is in the normal state, or the power is disconnected or otherwise not being supplied.

*1 The blink interval is 1 second (1 Hz).

Table 2-5 System status indicated by combination of LEDs

LED state			Description
POWER	XSCF STANDBY	CHECK	
	XSCF		
Off	Off	Off	Power is disconnected.
Off	Off	On	Power has just been turned on. The XSCF has detected an error.
Off	Blinking (*1)	Off	The XSCF is being initialized.
Off	On	Off	The XSCF is in the standby state. The system is waiting for power-on of the air conditioning facilities (in the data center).
On	On	Off	Warm-up standby processing is in progress. Once processing is complete, the system starts up. System startup processing is in progress. The system is operating.
On	On	On	Although the system is operating normally, an error has been detected.
Blinking (*1)	On	Off	System stop processing is in progress. Once processing is complete, the fan unit stops.

*1 The blink interval is 1 second (1 Hz).

2.3.2 LEDs on the rear panel (System locator)

The field engineer or system administrator can identify the chassis requiring maintenance by using the CHECK LED (A in the figure) on the rear panel. The CHECK LED on the rear panel is referred to as the system locator, and has the same function as the CHECK LED on the operation panel.

Figure 2-8 Location of the system locator

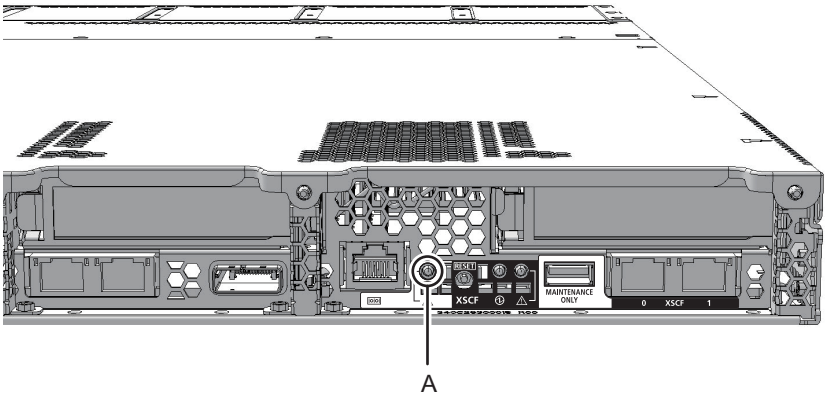


Table 2-6 Status of the system locator

Icon	Name	Color	Status	Description
⚠	CHECK	Amber	On	An error that prevents the system from starting has been detected.
			Blinking (*1)	Indicates that the chassis requires maintenance (this function is also referred to as the "locator").
			Off	The system is in the normal state, or the power is disconnected or otherwise not being supplied.

*1 The blink interval is 1 second (1 Hz).

2.3.3 LEDs on each component

Each component incorporates LEDs. These LEDs indicate a component that requires maintenance if that component experiences a failure. Start maintenance after checking the LEDs.
The LEDs on each component and the states that they indicate are as follows:

Table 2-7 LEDs on the motherboard unit and their states

Name	Color	Status	Description
READY	Green	On	Indicates that the component is operating. The component cannot be released and removed from the system.
		Blinking (*1)	Indicates that the component is currently being mounted on the system or being disconnected from the system.

Table 2-7 LEDs on the motherboard unit and their states *(continued)*

Name	Color	Status	Description
		Off	Indicates that the component is disconnected from the system. Indicates that the component can be removed and replaced.
CHECK	Amber	On	Indicates that an error has occurred.
		Blinking (*1)	Indicates that the component requires maintenance (this function is also referred to as the "locator").
		Off	Indicates the normal state.

*1 The blink interval is 1 second (1 Hz).

Table 2-8 LEDs on the LAN port and their states

Name	Color	Status	Description
ACT	Green	On	Indicates that communication is being performed.
		Off	Indicates that communication is not being performed.
LINK SPEED	Amber	On	Indicates that the communication speed is 1 Gbps.
	Green	Blinking (*1)	Indicates that the communication speed is 100 Mbps.
		Off	Indicates that the communication speed is 10 Mbps.

*1 The blink interval is 1 second (1 Hz).

Table 2-9 LED on the fan unit and its states

Name	Color	Status	Description
CHECK	Amber	On	Indicates that an error has occurred.
		Blinking (*1)	Indicates that the component requires maintenance (this function is also referred to as the "locator").
		Off	Indicates the normal state.

*1 The blink interval is 1 second (1 Hz).

Table 2-10 LED on the power supply unit and its states

Name	Color	Status	Description
CHECK	Green	On	Indicates that the input power is turned on and being supplied normally.
		Blinking (*1)	Indicates that the input power is being disconnected.
	Amber	On	Indicates that an error has occurred. Indicates that the input power to this power supply unit is turned off in redundant operation.
		Blinking (*1)	Indicates the warning status (an error has occurred but the power supply unit is operating).

Table 2-10 LED on the power supply unit and its states *(continued)*

Name	Color	Status	Description
		Off	Indicates that power is not being supplied.

*1 The blink interval is 1 second (1 Hz).

Table 2-11 LEDs on the internal disk and their states

Name	Color	Status	Description
READY	Green	Blinking	Indicates that the disk is being accessed. This LED is normally on, but it blinks while the disk is being accessed. While the LED is blinking, maintenance such as removal of the disk cannot be performed.
		Off	Indicates that maintenance such as the removal of the disk can be performed.
CHECK	Amber	On	Indicates that an error has occurred.
		Blinking (*1)	Indicates that the component requires maintenance (this function is also referred to as the "locator").
		Off	Indicates the normal state.

*1 The blink interval is 1 second (1 Hz).

Chapter 3

Troubleshooting

This chapter describes how to determine and confirm the cause if an error occurs.

- Suspected Failure Conditions
- Determining the Causes of Failures
- Identifying a Failure
- Downloading Error Log Information

3.1 Suspected Failure Conditions

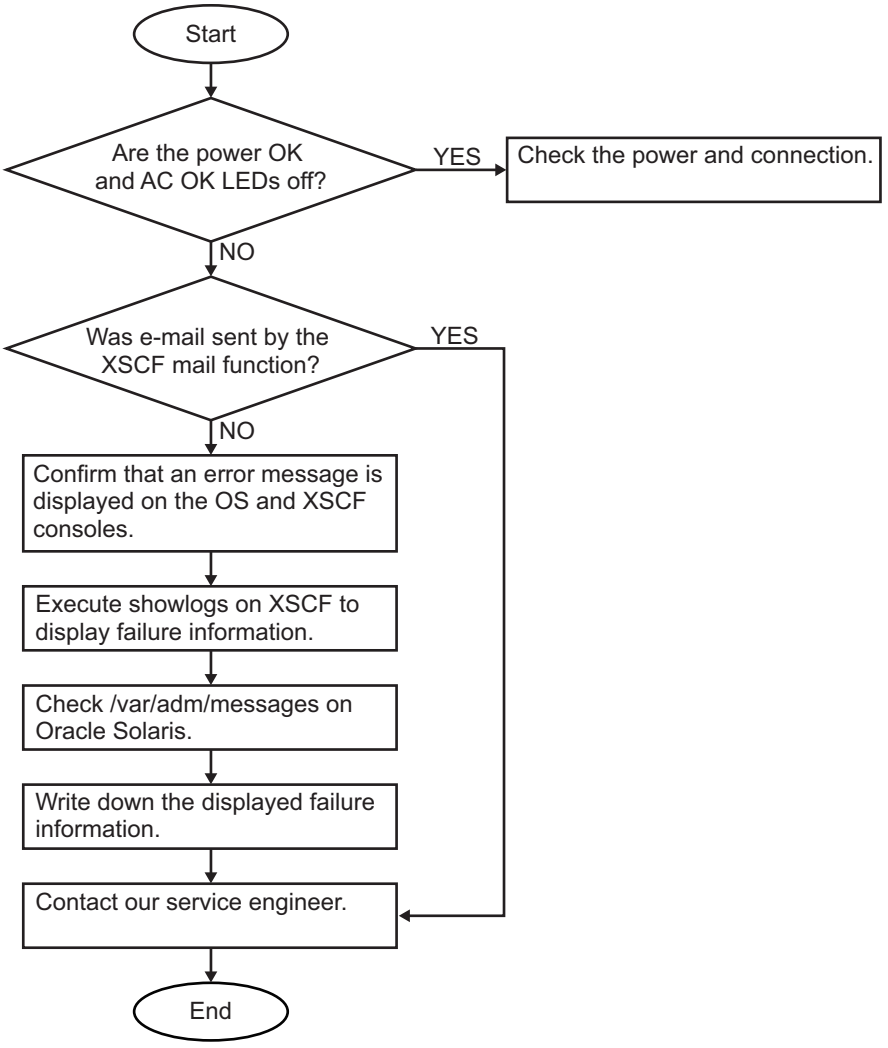
This section explains suspected failure conditions. Use the flow to determine the cause of a failure and identify the failure location in the following cases. For details on the flow for determining the cause of a failure, see "3.2 Determining the Causes of Failures."

- When the CHECK LED is on
- When an error message is displayed on the console
- When an error is displayed as a result of executing a command for checking the status
- When an error is displayed in the error log

3.2 Determining the Causes of Failures

This section explains the flow for determining the causes of failures. Also apply this flow to identify failures in the PCI expansion unit.

Figure 3-1 Troubleshooting flow


Start
Are the power OK and AC OK LEDs off?
YES
Check the power and connection.
NO
Was e-mail sent by the XSCF mail function?
YES
NO
Confirm that an error message is displayed on the OS and XSCF consoles.
Execute showlogs on XSCF to display failure information.
Check /var/adm/messages on Oracle Solaris.
Write down the displayed failure information.
Contact our service engineer.
End

3.3 Identifying a Failure

This section explains how to identify a failure. Use the flow described in "3.2 Determining the Causes of Failures" to determine the appropriate way of checking for a failure.

3.3.1 Checking the LED indications

Check the LEDs on the operation panel, rear panel, and on each component to identify a component requiring maintenance. Check the status of a component from its LED before starting any maintenance work on that component.

- Operation panel LEDs
  You can determine the status of the system by checking the LEDs on the operation panel. For details, see "2.3.1 Operation panel LEDs."
- Rear panel LED
  You can determine the status of the system by checking the CHECK LED on the rear panel of the chassis, which duplicates the CHECK LED on the operation panel. For details, see "2.3.2 LEDs on the rear panel (System locator)."
- LED on each component
  You can determine the location of an error by checking the LED on the component that incorporates the failed hardware if an error occurs with the hardware in the chassis. For details, see "2.3.3 LEDs on each component."

  Note that some components, such as memory, are not provided with LEDs. To check the status of a component that does not have an LED, execute XSCF shell commands such as the showhardconf command from the maintenance terminal. For details, see "3.3.3 Checking the status of a component."

3.3.2 Checking error messages

Display error messages to check the log information and an error overview.
You can use either of the following two methods to check the error messages:

- Checking error log information using the XSCF shell
  For details, see "12.1 Checking Log Saved with XSCF" in the *SPARC M10 Systems System Operation and Administration Guide*.
- Checking messages on Oracle Solaris
  For details, see "12.2 Checking Warning and Notification Messages" in the *SPARC M10 Systems System Operation and Administration Guide*.

3.3.3 Checking the status of a component

Execute XSCF firmware commands to determine the system hardware configuration and the status of each component.

showhardconf command

Execute the showhardconf command to determine the information on the component.

1. **Log in to the XSCF shell.**
2. **Execute the showhardconf command to acquire a list of components.**
   A failed component is indicated by an asterisk (*) at the beginning of the line.

```
XSCF> showhardconf
SPARC M10-1;
    + Serial:2101151008A; Operator_Panel_Switch:Locked;
    + System_Power:Off; System_Phase:Cabinet Power Off;
----------------------Omitted-----------------------
PCI#1 Status:Normal; Name_Property:;
            + Vendor-ID:14e4; Device-ID:1648;
            + Subsystem_Vendor-ID:10cf; Subsystem-ID:13a0;
            + Model: LPe1250-F8-FJ;
            + Connection:PCIBOX#X07P;
*           PCIBOX#X0DF Status:Faulted; Ver:0512 Serial:XCX0DF;
                + FRU-Part-Number:CF00541-0314 05   /501-6937-05;
                IOB Status:Normal; Serial:XX00KA; Type:PCI-X;
                    + FRU-Part-Number:CF00541-0316 03   /501-6938-05;
             LINKBORAD Status:Faulted; Ver:0512 Serial:XCX0DF;
                    + FRU-Part-Number:CF00541-0314 05   /501-6937-05;
                PCI#0 Name_Property:fibre-channel;
                    + Vendor-ID:14e4; Device-ID:1648;
                    + Subsystem_Vendor-ID:10cf; Subsystem-ID:13a0;
                    + Model: LPe1250-F8-FJ;
```

showstatus command

Execute the showstatus command to determine the status of the component.

1. **Log in to the XSCF shell.**
2. **Execute the showstatus command to determine the status.**
   A failed component is indicated by an asterisk (*) at the beginning of the line.

```
XSCF> showstatus
    MBU Status:Normal;
*       MEM#0A Status:Faulted;
```

The status of a component is displayed after the "Status:" string.
Table 3-1 shows the states of components.

Table 3-1 States of components

Display	Description
Normal	The unit is in the normal state.
Faulted	The unit is faulty and is not operating.
Degraded	A part of the unit has failed or degraded, but the unit is running.
Deconfigured	Due to the failure or degradation of another unit, the target unit and components of its underlying layer has been degraded, though there is no problem in them.
Maintenance	Maintenance is being performed. The replacefru or addfru command is being executed.

3.3.4 Checking the status of a PCI expansion unit

If a PCI expansion unit is connected, execute the ioxadm command to check the status of the PCI expansion unit.

ioxadm command

Execute the ioxadm command to determine the environmental conditions (temperature, voltage, etc.) or LED indications of the PCI expansion unit.

1. **Log in to the XSCF shell.**
2. **Execute the ioxadm command to determine the environmental conditions of the specified PCI expansion unit.**
   To specify a PCI expansion unit, enter the serial number of the PCI expansion unit after determining it with the ioxadm list command.

   The following example shows the environmental conditions for PCIBOX#2008. "2008" is the last four digits of the serial number of the PCI expansion unit.

```
XSCF> ioxadm env -te PCIBOX#2008
Location                  Sensor            Value Resolution Units
PCIBOX#2008               AIRFLOW         180.000      0.000 CHM
PCIBOX#2008               P_CONSUMPTION    68.000      0.000 W
PCIBOX#2008/PSU#0         FAN            3936.000      0.000 RPM
PCIBOX#2008/PSU#1         FAN            3584.000      0.000 RPM
PCIBOX#2008/FAN#0         FAN            3374.000      0.000 RPM
PCIBOX#2008/FAN#1         FAN            3374.000      0.000 RPM
PCIBOX#2008/FAN#2         FAN            3374.000      0.000 RPM
PCIBOX#2008/IOBT          T_INTAKE         26.000      0.000 C
PCIBOX#2008/IOBT          T_PART_NO0       31.500      0.000 C
PCIBOX#2008/IOBT          T_PART_NO1       30.750      0.000 C
PCIBOX#2008/IOBT          T_PART_NO2       31.500      0.000 C
PCIBOX#2008/IOBT          V_12_0V          12.069      0.000 V
PCIBOX#2008/IOBT          V_3_3_NO0         3.293      0.000 V
PCIBOX#2008/IOBT          V_3_3_NO1         3.295      0.000 V
PCIBOX#2008/IOBT          V_3_3_NO2         3.291      0.000 V
PCIBOX#2008/IOBT          V_3_3_NO3         3.300      0.000 V
PCIBOX#2008/IOBT          V_1_8V            1.804      0.000 V
PCIBOX#2008/IOBT          V_0_9V            0.900      0.000 V
```

3.3.5 Checking log information

Execute the showlogs command to determine the error log information.

1. **Log in to the XSCF shell.**
2. **Execute the showlogs command to determine the error log information.**
   Failed components are displayed as a list in in chronological order of failure.

   The following example shows that an Alarm status occurred in PSU#1 and PSU#2 at 12:45:31 on Oct 20, the Alarm status changed to a Warning status at

15:45:31 on the same day, and then the Alarm status further expanded to PSU#1, PSU#2, and PSU#3 at 17:45:31 on the same day.

```
XSCF> showlogs error
Date: Oct 20 12:45:31 JST 2012
    Code: 00112233-445566778899aabbcc-8899aabbcceeff0011223344
    Status: Alarm                 Occurred: Oct 20 12:45:31.000 JST 2012
    FRU: PSU#1,PSU#2
    Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
Date: Oct 20 15:45:31 JST 2012
    Code: 00112233-445566778899aabbcc-8899aabbcceeff0011223344
    Status: Warning               Occurred: Oct 20 15:45:31.000 JST 2012
    FRU: PSU#1,PSU#2
    Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
Date: Oct 20 17:45:31 JST 2012
    Code: 00112233-445566778899aabbcc-8899aabbcceeff0011223344
    Status: Alarm                 Occurred: Oct 20 17:45:31.000 JST 2012
    FRU: PSU#1,PSU#2, PSU#3,*
    Msg: ACFAIL occurred (ACS=3)(FEP type = A1)
```

3.3.6 Checking the messages of the predictive self-repairing tool

Check the messages output from the Oracle Solaris Fault Manager predictive self-repairing tool, running on Oracle Solaris. Oracle Solaris Fault Manager supports the following functions:

- Receives telemetry information about errors.
- Troubleshooting
- Disables the components that have experienced errors.
- Turns on the LED of a component that has experienced an error and displays the details in the system console message.

Table 3-2 lists typical messages that are generated if an error occurs. These messages indicate that the fault has already been diagnosed. If corrective actions can be taken by the system, this indicates that they have already been taken. In addition, if the system is running, corrective actions continue to be applied.
Messages are displayed on the console and are recorded in the /var/adm/messages file.

Table 3-2 Predictive self-repairing messages

Output Displayed	Description
Nov 1 16：30：20 dt88-292 EVENT-TIME：Tue Nov 1 16：30：20 PST 2005	EVENT-TIME: Time stamp of the diagnosis
Nov 1 16：30：20 dt88-292 PLATFORM：ORCL,SPARC64-X, CSN：-,HOSTNAME：dt88-292	PLATFORM: Description of the chassis in which the error occurred

Table 3-2 Predictive self-repairing messages *(continued)*

Output Displayed	Description
Nov 1 16：30：20 dt88-292 SOURCE：eft, REV：1.13	SOURCE: Information on the diagnosis engine used to identify the error
Nov 1 16：30：20 dt88-292 EVENT-ID：afc7e660-d609-4b2f-86b8-ae7c6b8d50c4	EVENT-ID: Universally unique event ID for this error
Nov 1 16：30：20 dt88-292 DESC： Nov 1 16：30：20 dt88-292 A problem was detected in the PCI Express subsystem	DESC: Basic description of the error
Nov 1 16：30：20 dt88-292 Refer to http://support.oracle.com/msg/SUN4-8000-0Y for more information.	Website: Where to find specific information and actions to apply in the event of this error
Nov 1 16：30：20 dt88-292 AUTO-RESPONSE：One or more device instances may be disabled.	AUTO-RESPONSE: What the system has done (if anything) to alleviate any subsequent problems
Nov 1 16：30：20 dt88-292 IMPACT：Loss of services provided by the device instances associated with this fault.	IMPACT: Description of the assumed impact of the failure
Nov 1 16：30：20 dt88-292 REC-ACTION：Schedule a repair procedure to replace the affected device.Use Nov 1 16：30：20 dt88-292 fmdump -v –u EVENT_ID to identify the device or contact Sun for support.	REC-ACTION: Brief description of the corrective action the system administrator should apply

3.3.7 Identifying the location of the chassis requiring maintenance

Execute the setlocator command to identify the location of the chassis requiring maintenance by causing the CHECK LED on the operation panel and the CHECK LED (locator) on the rear panel to blink.

1. **Log in to the XSCF shell.**
2. **Execute the setlocator command to identify the location of the chassis requiring maintenance by causing the CHECK LED of the chassis to blink.**
   The CHECK LEDs on the operation and rear panels blink.

```
XSCF> setlocator blink
```

For details on the location of the CHECK LED and the procedure for checking it, see "2.3 Checking the LED Indications."

3.4 Downloading Error Log Information

This section describes the procedure for downloading error log information.
To download error log information, use the XSCF log fetch function. The XSCF has a USB port that is specifically for maintenance, allowing maintenance information such as error logs to be easily obtained.
For details, see "12.1.15 Saving a log to a file with snapshot" and "12.1.16 Saving a log to a local USB device" in *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.

Chapter 4

Preparing for Maintenance

This chapter describes the preparations that must be completed prior to performing any maintenance as well as the types of maintenance.

- Preparing Tools Required for Maintenance
- Confirming the System Configuration
- Understanding Types of Maintenance

4.1 Preparing Tools Required for Maintenance

This section explains the tools required for performing maintenance. Table 4-1 lists the tools required for maintenance.

Table 4-1 Maintenance tools

Item	Use
Phillips screwdriver (No.2)	For removing or installing screws
Torx screwdriver (T10)	For removing or installing screws
Wrist strap	For static grounding
ESD mat	For static grounding

4.2 Confirming the System Configuration

This section explains how to check the hardware and software configurations.
The system configuration must be the same before and after maintenance work. If an error occurs in the system, record the system configuration and the states of the

components before starting maintenance. Then, after completing maintenance, confirm that the system configuration is the same as that before maintenance.

4.2.1 Confirming the hardware configuration

Execute the showhardconf command to confirm the configuration and status of the components mounted on the chassis. Before performing any maintenance work, check and record the hardware configuration of the chassis.

1. **Log in to the XSCF shell.**
2. **Execute the showhardconf command to confirm the hardware configuration information.**

```
XSCF> showhardconf
```

The following information appears:

- Current configuration and status
- Number of mounted Field Replaceable Units (FRU)
- Status of the unit in which a physical partition error or degradation occurred
- Information on the PCI expansion unit
- Name properties of the PCI Express (PCIe) card

4.2.2 Confirming the software and firmware configurations

The software and firmware configurations and versions affect system operation. To change the configuration or investigate a problem, check the latest state and check for any problems in the software.

Confirming the software configuration

Use Oracle Solaris commands to check the software configuration.
If you are logged in to the XSCF console, switch to the control domain console by executing the console command beforehand.
Table 4-2 lists the commands used for checking the software configuration.

Table 4-2 Commands for checking the software configuration

Command	Description
pkg(1) (Oracle Solaris 11) showrev(1M) (Oracle Solaris 10)	Displays Oracle Solaris correction information and the version.
ldm(1M)	Displays logical domain configuration information.

1. **Log in to the control domain console of the physical partition where the**

component to be maintained is mounted.
For information on how to log in to the control domain console, see "8.3 Switching to the Control Domain Console from the XSCF Shell" in *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.

2. **Execute the pkg(1) command to display Oracle Solaris correction information and the version.**
For Oracle Solaris 11, execute the pkg(1) command.

```
# pkg info entire
          Name: entire
       Summary: entire incorporation including Support Repository Update
(Oracle Solaris 11.1.12.5.0).
```

For Oracle Solaris 10, execute the showrev(1M) command.

```
# showrev -p
```

To display the version of Oracle VM Server for SPARC, execute the ldm(1M) command.

```
# ldm -V
Logical Domains Manager (v 3.1)

        Hypervisor control protocol v 1.9
        Using Hypervisor MD v 1.3
```

Confirming the firmware configuration

Use XSCF shell commands to confirm the XSCF firmware configuration.

1. **Log in to the XSCF shell.**
2. **Execute the version command to confirm the firmware version information.**
In the following example, "-c xcp" is entered to confirm the overall XCP version.

```
XSCF> version -c xcp
```

4.2.3 Confirming the FRU information and resource information

Use XSCF shell commands to check the FRU information and resource information.

Table 4-3 lists the commands used for checking the FRU information and resource information. For details on each command, see the *Fujitsu M10/SPARC M10 Systems XSCF Reference Manual* of the XCP firmware version used.

Table 4-3 Commands for checking FRU information and resource information

Command	Description
showstatus	Displays the FRU status. Out of the FRUs in the system configuration, this command displays information on a faulty or degraded unit or FRU.
showboards	Displays information on a physical system board (PSB). Displays information on a physical system board that belongs to the specified physical partition and information on all the physical system boards that are mounted.
showpcl	Displays the configuration information for a physical partition (hardware resource information).
showfru	Displays the setting information for a device.

4.3 Understanding Types of Maintenance

This section describes the types of maintenance performed on the SPARC M10-1.

The definitions of terms used in this document are as follows.

Table 4-4 Definitions of terms

Term	Definition
Physical partition requiring maintenance	Physical partition to which SPARC M10-1, in which Field Replaceable Unit (FRU) requiring maintenance is mounted, belongs
Chassis requiring maintenance	Chassis of SPARC M10-1, in which Field Replaceable Unit (FRU) requiring maintenance is mounted

The following three types of maintenance for SPARC M10-1 are available, depending on the state of the physical partition requiring maintenance in combination with the state of the input power of the chassis requiring maintenance.

Table 4-5 Types of SPARC M10-1 maintenance

State of physical partition requiring maintenance	State of input power of chassis requiring maintenance	Type of maintenance
Active State in which Oracle Solaris is operating during maintenance	Hot State in which the power cord of the chassis remains connected	Active/hot maintenance
Inactive (system stopped) State in which Oracle Solaris is stopped during maintenance	Hot State in which the power cord of the chassis remains connected	Inactive/hot maintenance (system stopped/hot maintenance)
	Cold State in which the power cord of chassis is unplugged	Inactive/cold maintenance (system stopped/cold maintenance)

SPARC M10-1 has the only one physical partition. Thus, the state in which the physical partition requiring maintenance is stopped is the same as the state in which the entire system is stopped.

Details of the respective types of maintenance are as follows.

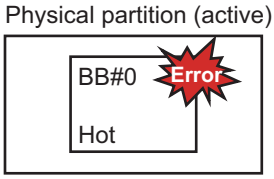
Active/hot maintenance

Maintenance is performed while Oracle Solaris is operating in the physical partition.

The following FRUs are targets of active/hot maintenance.

- Power supply unit with redundant configuration
- Fan unit
- Internal disk (HDD/SSD)

Figure 4-1 Active/hot maintenance



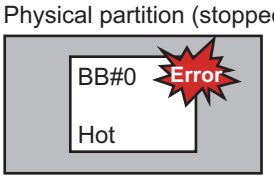
Inactive/hot maintenance (system stopped/hot maintenance)

Maintenance is performed with the physical partition powered off. Maintenance is performed with the power cord of the chassis requiring maintenance connected.

The following FRUs are targets of inactive/hot maintenance (system stopped/hot maintenance).

- Power supply unit with redundant configuration
- Fan unit
- Internal disk (HDD/SSD)

Figure 4-2 Inactive/hot maintenance (system stopped/hot maintenance)



Inactive/cold maintenance (system stopped/cold maintenance)

Maintenance is performed with the physical partition powered off. Maintenance is performed with the power cord of the chassis requiring maintenance unplugged.

The following FRUs are targets of inactive/cold maintenance (system stopped/cold maintenance).

- All FRUs

Figure 4-3 Inactive/cold maintenance (system stopped/cold maintenance)

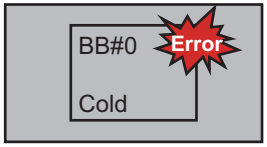


Table 4-6 shows the types of maintenance applicable to each FRU.

Table 4-6 Maintenance types for FRUs

-: Maintenance cannot be performed.

FRU	Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)	Reference
Motherboard unit	-	-	OK	Chapter 7
Memory	-	-	OK	Chapter 8
Power supply unit	OK	OK	OK	Chapter 9
Fan unit	OK	OK	OK	Chapter 10
Internal disk	OK (*)	OK	OK	Chapter 11
PCIe card	-	-	OK	Chapter 12
PSU backplane	-	-	OK	Chapter 13
HDD backplane	-	-	OK	Chapter 14
Operation panel	-	-	OK	Chapter 15
Cable kit	-	-	OK	Chapter 16

*: Supported only for the internal disk of devices other than a boot device. If, however, the boot device has a redundant configuration (RAID configuration), active/hot maintenance is supported.

Chapter 5

Understanding the Preparations for Enabling Maintenance

This chapter describes the preparations that must be performed prior to physically removing a component. See this chapter, as required, when performing the maintenance work on each component described in Chapter 7 onwards.

- Releasing an FRU from the System with the replacefru Command
- Stopping the System
- Accessing Components

Caution - Do not operate the Field Replaceable Unit (FRU) requiring maintenance while OpenBoot PROM is running (the ok prompt is displayed). After turning off the physical partition (stopping the system) or starting Oracle Solaris, operate the FRU requiring maintenance.

5.1 Releasing an FRU from the System with the replacefru Command

This section describes the procedure for releasing an FRU requiring maintenance from the system. The following FRUs can be maintained.

- Power supply unit
- Fan unit

1. **Log in to the XSCF shell.**
2. **Execute the replacefru command to display the maintenance menu.**

```
XSCF> replacefru
```

3. **Select the FRU requiring maintenance by specifying it with a numeric key.**
   In the following example, since the fan unit is selected, "1" is entered.

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select a type of model which has FRU to be replaced.

1. FAN         (Fan Unit)
2. PSU         (Power Supply Unit)
--------------------------------------------------------------------------------
Select [1,2|c:cancel] :1
```

4. **Select the FRU requiring maintenance by specifying it with a numeric key.**
   In the following example, since FAN#6 is showing "Faulted" indicating an error, "7" is entered.

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select a FRU to be replaced.

No. FRU                 Status
--- ------------------- --------------
 1  /FAN#0              Normal
 2  /FAN#1              Normal
 3  /FAN#2              Normal
 4  /FAN#3              Normal
 5  /FAN#4              Normal
 6  /FAN#5              Normal
 7  /FAN#6              Faulted
--------------------------------------------------------------------------------
Select [1-7|b:back] :7
```

5. **After confirming that the selected FRU is displayed, enter [r].**

```
You are about to replace FAN#6.
Do you want to continue?[r:replace|c:cancel] : r
```

6. **Confirm that the CHECK LED of the FRU is blinking.**
   For the location of CHECK LED, see "2.3.3 LEDs on each component."

```
Please execute the following steps:
1) Confirm the Check LED is blinking.
2) Remove FAN#6.
3) Execute either the following:
  3-1) After installing the exchanged device, please select 'finish'.
  3-2) If you want to suspend the maintenance without exchanging device,
       please select 'cancel'.
[f:finish|c:cancel] :
```

You can now start FRU maintenance. For the power supply unit, see "9.4 Removing a Power Supply Unit" and for the fan unit, see "10.4 Removing a Fan Unit."

5.2 Stopping the System

This section describes the procedures for stopping the system.
There are two ways of stopping the system, as follows:

- Stopping the system with an XSCF command
- Stopping the system from the operation panel

Note - Before stopping the system, inform the users that the system will be stopped.
Note - If a physical partition is stopped by executing the XSCF command or through the operation panel, all the logical domains on the physical partition are stopped. Stop the application if required.

---

1. **Stop the system.**
   For details, see "5.2.1 Stopping the system with an XSCF command" or "5.2.2 Stopping the system from the operation panel."
2. **Execute the showpparstatus command to confirm that the power to the physical partition is turned off.**
   In the following example, [PPAR Status] of PPAR-ID 00 displays "Powered Off", which indicates that the power to the physical partition has been turned off.

```
XSCF> showpparstatus -a
PPAR-ID         PPAR Status
00              Powered Off
```

3. **Execute the showdomainstatus command to confirm the operating condition of the logical domain.**
   In the following example, [Status] of the logical domain displays "Solaris powering down", which indicates that Oracle Solaris is shutting down.

```
XSCF>  showdomainstatus -p 0
Logical Domain Name   Status
primary               Solaris powering down
4S-159-D0-G0          Solaris powering down
4S-159-D0-G1          Solaris powering down
4S-159-D0-G2          Solaris powering down
```

5.2.1 Stopping the system with an XSCF command

1. **Switch the mode switch on the operation panel to Service mode.**
   For details, see "2.2.2 Control function of the operation panel."
2. **Log in to the XSCF shell.**
3. **Execute the poweroff command.**

Enter "y" in response to the confirmation message.

In the following example, the status of PPAR-ID 00 displays "Powering off", telling you that the instruction to power off a physical partition was successfully completed.

```
XSCF> poweroff -a
PPAR-IDs to power off:00
Continue? [y|n] :y
00 : Powering off
```

The following processes are performed.

- Oracle Solaris is completely shut down.
- The system stops and enters the POWERON READY status (the XSCF is running).

For details, see "6.2.2 Stopping entire system" in the *SPARC M10 Systems System Operation and Administration Guide*.

4. **Check that the POWER LED on the operation panel is off.**

5.2.2 Stopping the system from the operation panel

1. **Switch the mode switch on the operation panel to Service mode.**
   For details, see "2.2.2 Control function of the operation panel."
2. **Press the power switch on the operation panel for 4 seconds or more.**
   For details, see "2.2.2 Control function of the operation panel."
3. **Check that the POWER LED on the operation panel is off.**

5.3 Accessing Components

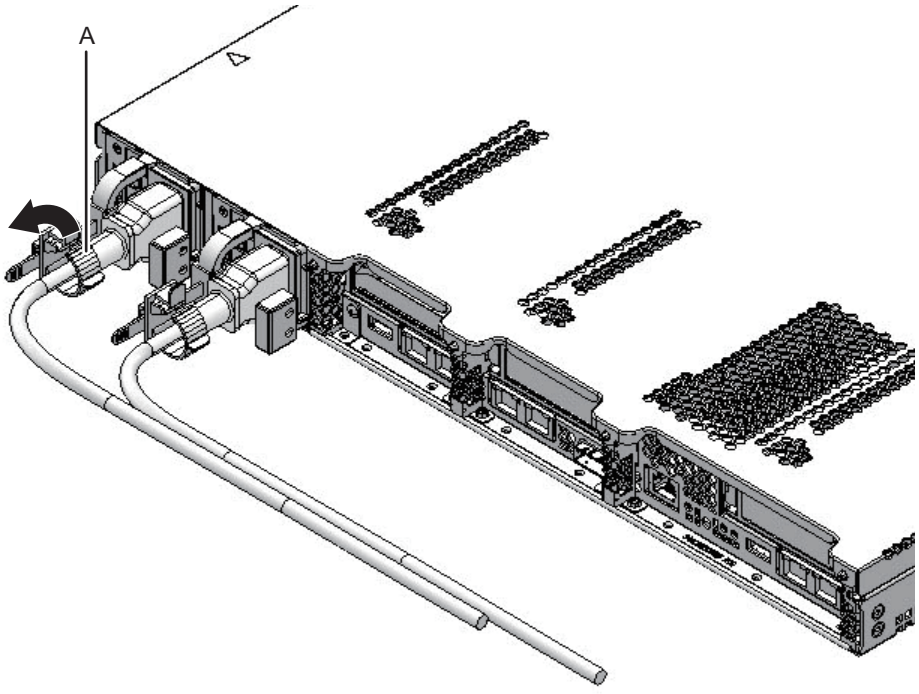
This section explains the operations to be performed before accessing components requiring maintenance. The operations to be performed vary depending on the components requiring maintenance.

5.3.1 Removing the power cords

Remove the cable clamp from each power cord, and then remove the power cords.

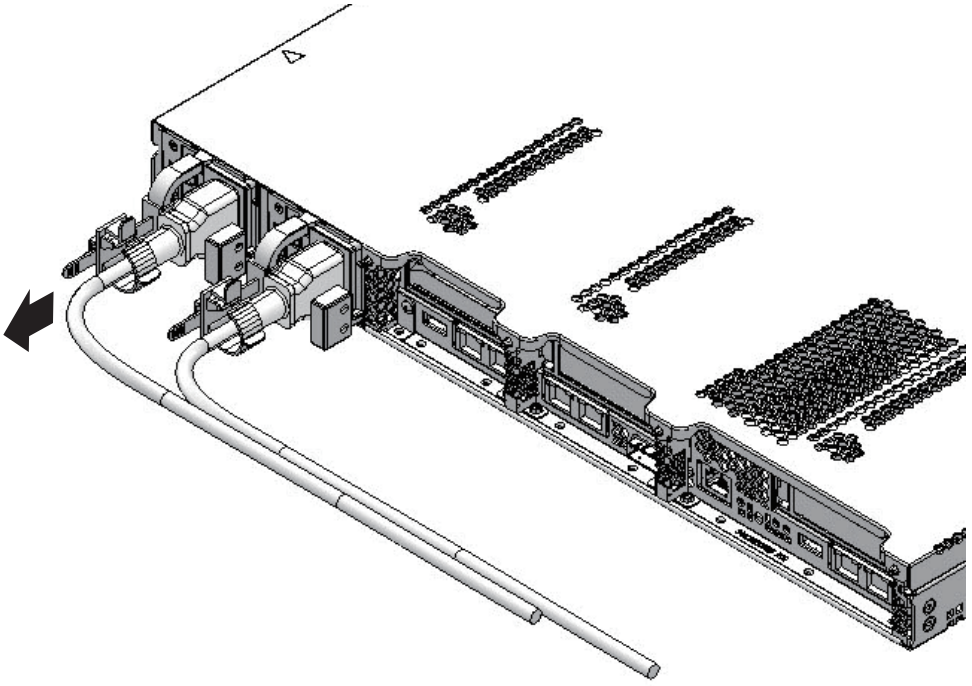
1. **Release the latch (A in the figure) of the cable clamp.**
   Pulling the cable clamp toward the rear of the chassis facilitates the release of the latch.

Figure 5-1 Releasing the cable clamp



2. **Remove the power cords from the power supply unit.**

Figure 5-2 Removing the power cords



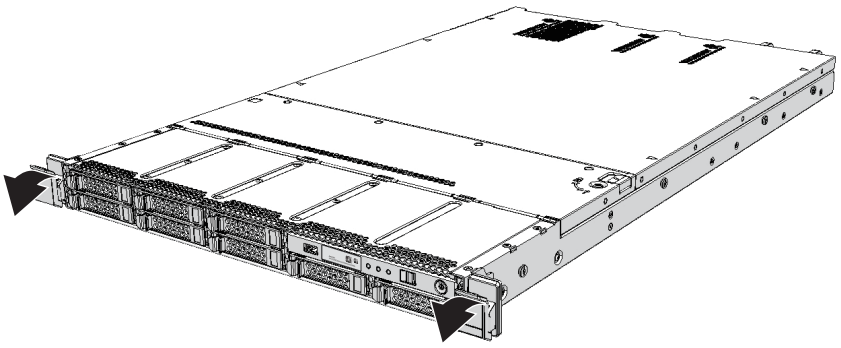
5.3.2 Pulling the chassis out from the rack

To perform maintenance on an internal component in a chassis, pull the chassis out of the rack.

Caution - If the rack is supplied with a quakeresistant options kit, install it. The quakeresistant options kit will prevent the rack from falling over when pulling the chassis out along the slide rail when performing maintenance.

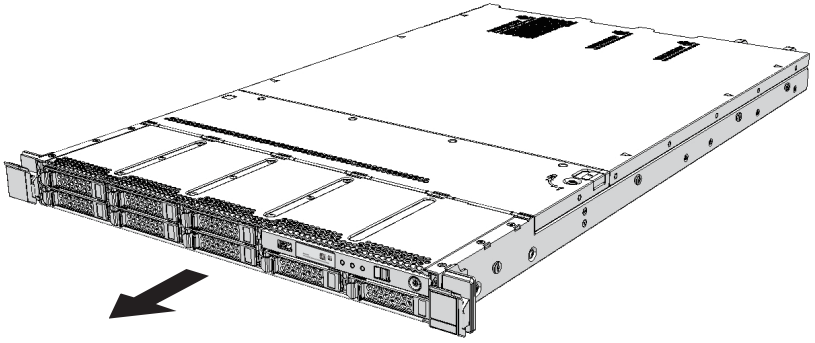
1. **Pull the levers on the right and left side of the chassis outward to release the lock holding the chassis.**

Figure 5-3 Levers on the right and left sides



2. **While pulling the levers outward, pull the chassis out as far as possible.**
   Once the chassis has been completely pulled out, it is automatically locked into the prescribed position.

Figure 5-4 Pulling out the chassis

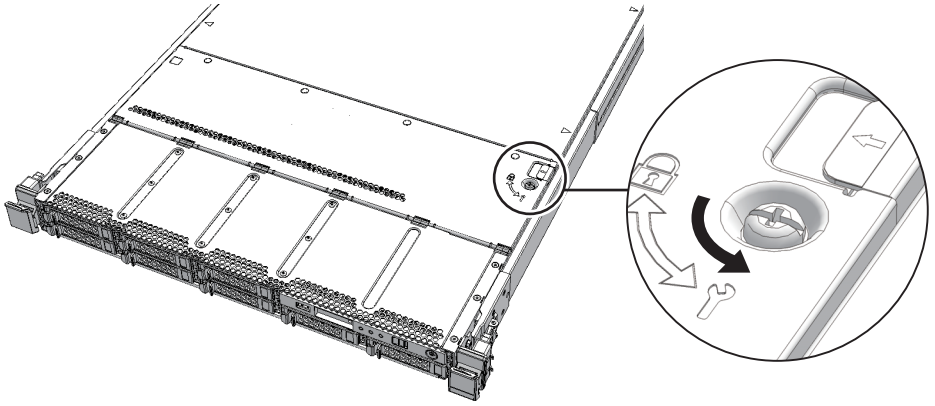


5.3.3 Opening the fan cover

To perform maintenance on an internal component in a chassis, pull the chassis out of the rack, and then open the fan cover.

1. **Turn the locking screw to the Service position ( ) to release the lock.**

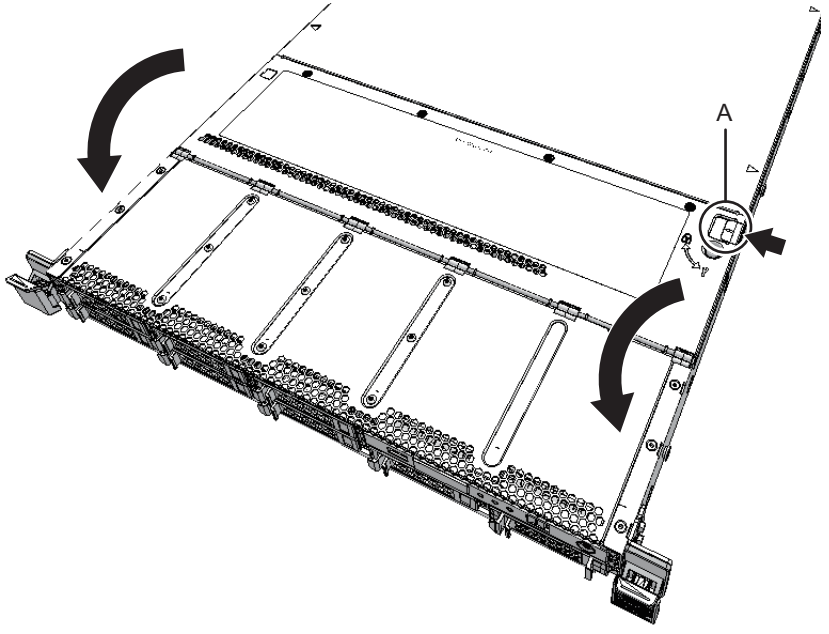
Figure 5-5 Releasing the lock



2. **While pressing the green slide button (A in the figure) toward the inside of the chassis, hold the edge of the fan cover and open it in the direction of the arrows.**

Note - The fan cover does not open through 180 degrees.

Figure 5-6 Opening the fan cover

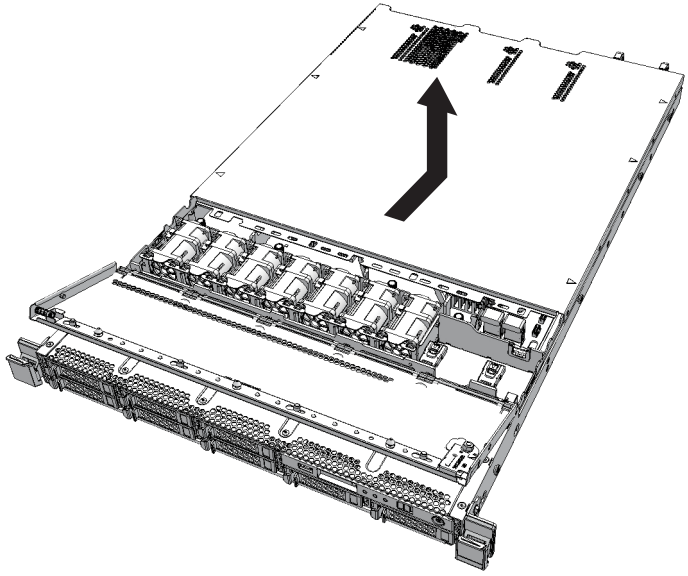


5.3.4 Removing the upper cover

To perform maintenance on an internal component in a chassis, pull the chassis out of the rack, open the fan cover, and then remove the upper cover.

1. **Slide the upper cover toward the rear of the chassis to remove it.**

Figure 5-7 Opening the upper cover

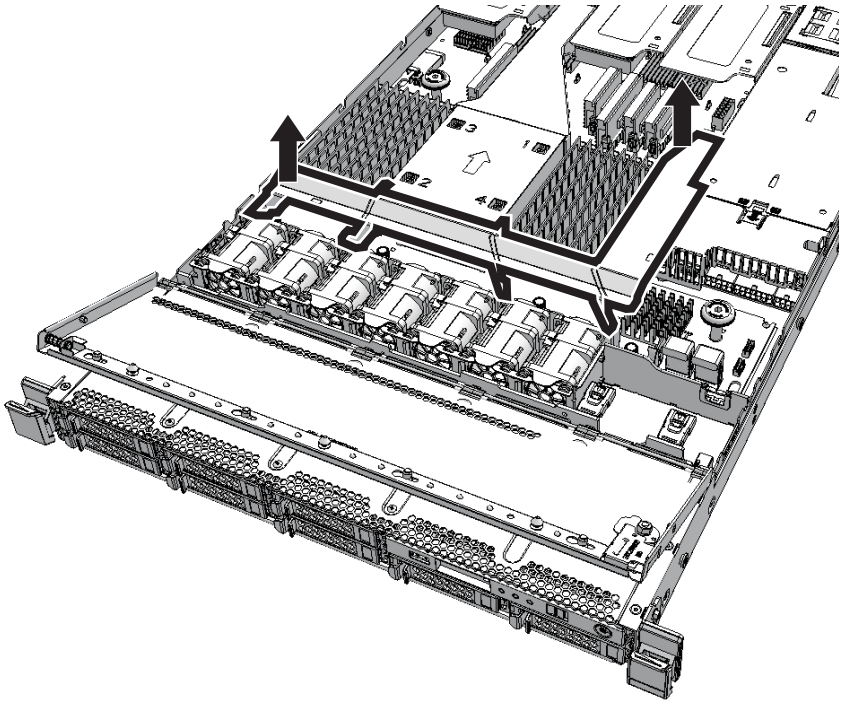


5.3.5 Removing the air duct and PSU backplane cover

To perform maintenance on the motherboard unit, memory, or PSU backplane, remove the air duct and PSU backplane cover.

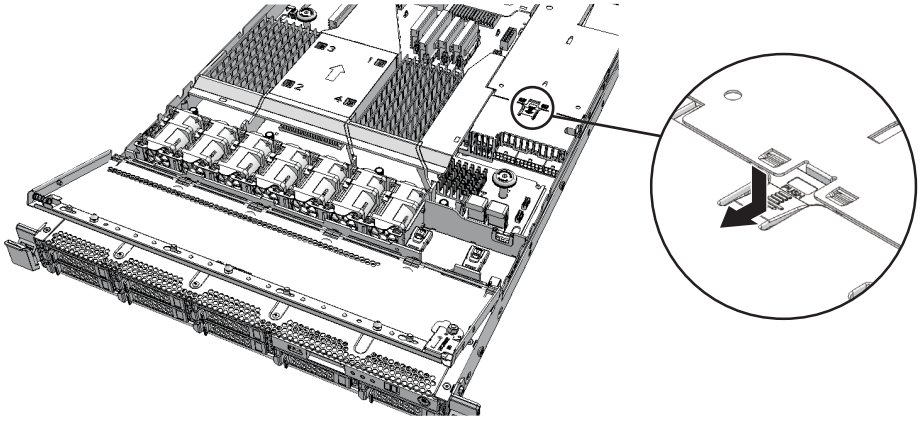
1. **Lift the air duct up by both sides to remove it.**

Figure 5-8 Removing the air duct



2. **Remove the PSU backplane cover by sliding it to the front of the chassis while pressing the latch of the PSU backplane cover.**

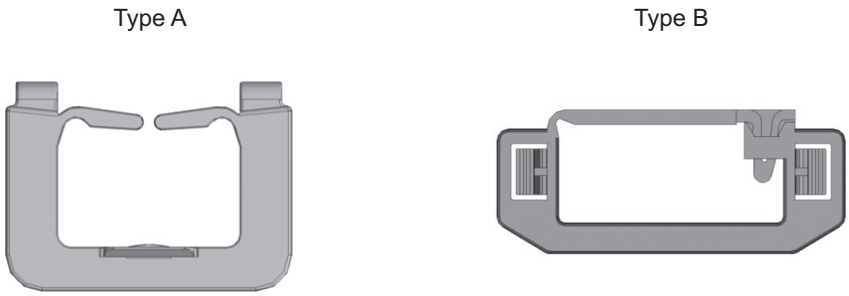
Figure 5-9 Removing the PSU backplane cover



5.3.6 Releasing the cable guide lock

To perform maintenance by removing the cables connected to the motherboard unit, remove the cables by releasing the cable guide lock.
There are the following two types of cable guides. Type B cable guide has a lock that is released.

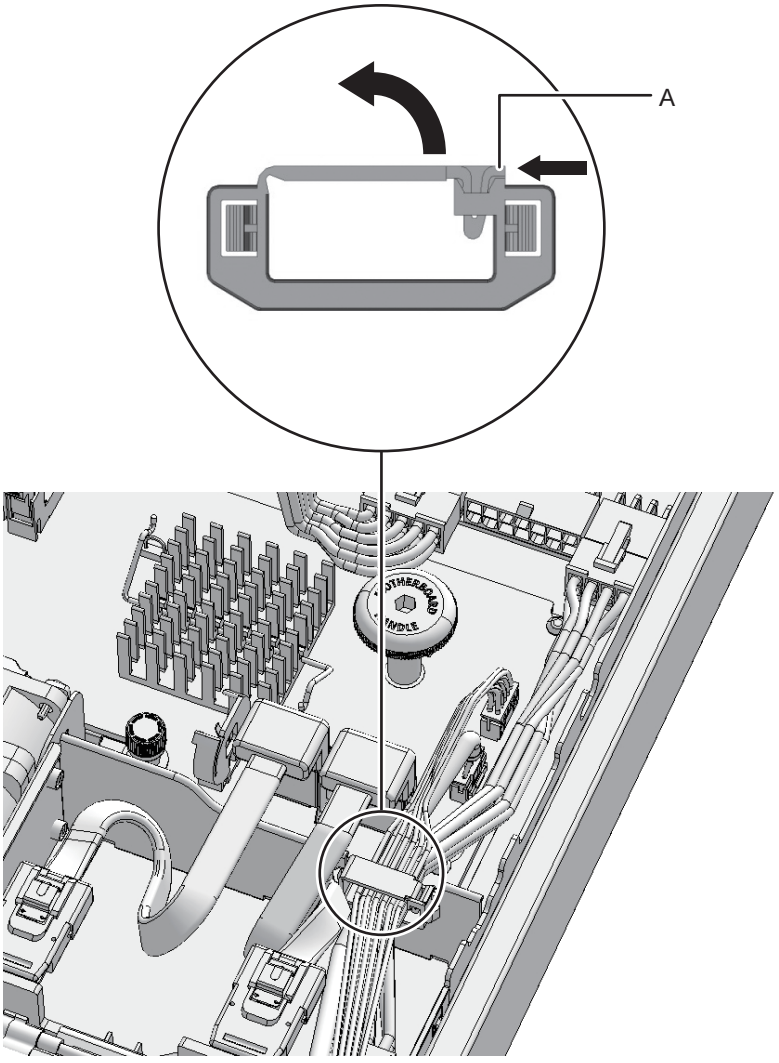
Figure 5-10 Types of cable guides



Type	How to remove the cables
Type A	Remove the cables from the cable guide by pulling them up.
Type B	Release the cable guide lock and remove the cables from the guide.

1. **Release the cable guide lock by pressing the lock toward the inside of the chassis (A in the figure).**

Figure 5-11 Releasing the cable guide lock



Chapter 6

Understanding the Preparations for Restoring the System

This chapter describes how to perform the work required to restore the system after component maintenance. See this chapter, as required, when performing the maintenance work on each component described in Chapter 7 onwards.

- Incorporating an FRU into the System with the replacefru Command
- Starting the System
- Restoring the Chassis

6.1 Incorporating an FRU into the System with the replacefru Command

This section describes the procedure for incorporating a Field Replaceable Unit (FRU) into the system after maintenance. To do this, resume the replacefru command, which is running, to incorporate the FRU into the system. The following FRUs can be maintained.

- Power supply unit
- Fan unit

1. **After performing maintenance on the FRU, return to the operation of the XSCF firmware replacefru command, and then enter "f".**

```
Please execute the following steps:
1) Confirm the Check LED is blinking.
2) Remove FAN#6.
3) Execute either the following:
  3-1) After installing the exchanged device, please select 'finish'.
  3-2) If you want to suspend the maintenance without exchanging device,
       please select 'cancel'.
[f:finish|c:cancel] :f
```

The following screen is displayed. Wait until the processing has completed.

```
Waiting for FAN#6 to enter install state.
[This operation may take up to 1 minute(s)]
(progress scale reported in seconds)
   0.. done

Diagnostic tests for FAN#6 have started.
[This operation may take up to 6 minute(s) 30 second(s)]
(progress scale reported in seconds)
   0....  30.....  60.....  90. done
```

If your XSCF firmware version is earlier than XCP 2220, the underlined part is displayed as "4 minute(s)."

2. **Confirm that the status is normal ("Normal") after diagnosis, and then enter "f".**

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Status of the replaced FRU.

FRU                 Status
------------------- --------------
/FAN#6              Normal
--------------------------------------------------------------------------------
The replacement of FAN#6 has completed normally.[f:finish] :f
```

3. **When the maintenance menu appears, enter "c" to exit the operation.**

```
--------------------------------------------------------------------------------
Maintenance/Replacement Menu
Please select a type of model which has FRU to be replaced.

1. FAN        (Fan Unit)
2. PSU        (Power Supply Unit)
--------------------------------------------------------------------------------
Select [1,2|c:cancel] :c
```

6.2 Starting the System

This section explains the procedure for starting the system.
The system can be started in either of the following two ways:

- Starting the system with an XSCF command
- Starting the system from the operation panel

1. **Check that the XSCF STANDBY LED on the operation panel is on.**
2. **Switch the mode switch on the operation panel to Locked mode.**

For details, see "2.2.2 Control function of the operation panel."

3. **Log in to the XSCF shell.**
4. **Execute the showstatus command to confirm that the FRU is operating normally after the completion of maintenance.**
   Nothing is displayed in the normal state.

```
XSCF> showstatus
```

5. **Execute the showhardconf command to check the hardware configuration and the status of each component.**

```
XSCF> showhardconf
SPARC M10-1;
    + Serial:2101151008A; Operator_Panel_Switch:Locked;
    + System_Power:Off; System_Phase:Cabinet Power Off;
    Partition#0 PPAR_Status:Powered Off;
    MBU Status:Normal; Ver:2004h; Serial:USDA-P00007 ;
        + FRU-Part-Number:CA20366-B10X 002AB/LGA-MBU -01 ;
        + Power_Supply_System: Dual ;
        + Memory_Size:32 GB; Type: A ;
    CPU#0 Status:Normal; Ver:4142h; Serial: 00010448;
        + Freq:2.800 GHz; Type:0x10;
        + Core:16; Strand:2;
    MEM#00A Status:Normal;
        + Code:ce8002M393B5270DH0-YH9 0000-85A8EFD9;
        + Type:01; Size:4 GB;
----------------------Omitted-----------------------
FANU#0 Status:Normal;
FANU#1 Status:Normal;
FANU#2 Status:Normal;
FANU#3 Status:Normal;
FANU#4 Status:Normal;
----------------------Omitted-----------------------
```

6. **Start the system.**
   For details, see "6.2.1 Starting the system with an XSCF command" or "6.2.2 Starting the system from the operation panel."

   After a short while, the following processes are performed.

   - The POWER LED on the operation panel comes on.
   - Power-on self-test (POST; self diagnosis when powering on) is executed.

   Then, the system starts up. For details, see "6.1 Starting the System" in the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.

6.2.1 Starting the system with an XSCF command

1. **Execute the poweron command.**

Enter "y" in response to the confirmation message.

```
XSCF> poweron -a
PPAR-IDs to power on:00
Continue? [y|n] :y
00 : Powering on
```

6.2.2 Starting the system from the operation panel

1. **Press the power switch on the operation panel for 1 second or more (less than 4 seconds).**
   For details, see "2.2.2 Control function of the operation panel."

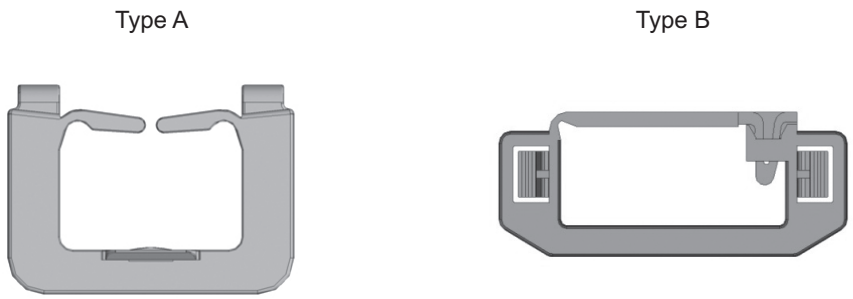
6.3 Restoring the Chassis

This section explains how to restore the chassis. If the maintenance has been done by pulling the chassis out of the rack, restoration of the chassis is required.

6.3.1 Locking the cable guide

If the maintenance has been done by removing the cables connected to the motherboard unit, lock the cable guide after storing the cables in it.
There are the following two types of cable guides. Type B cable guide is locked.

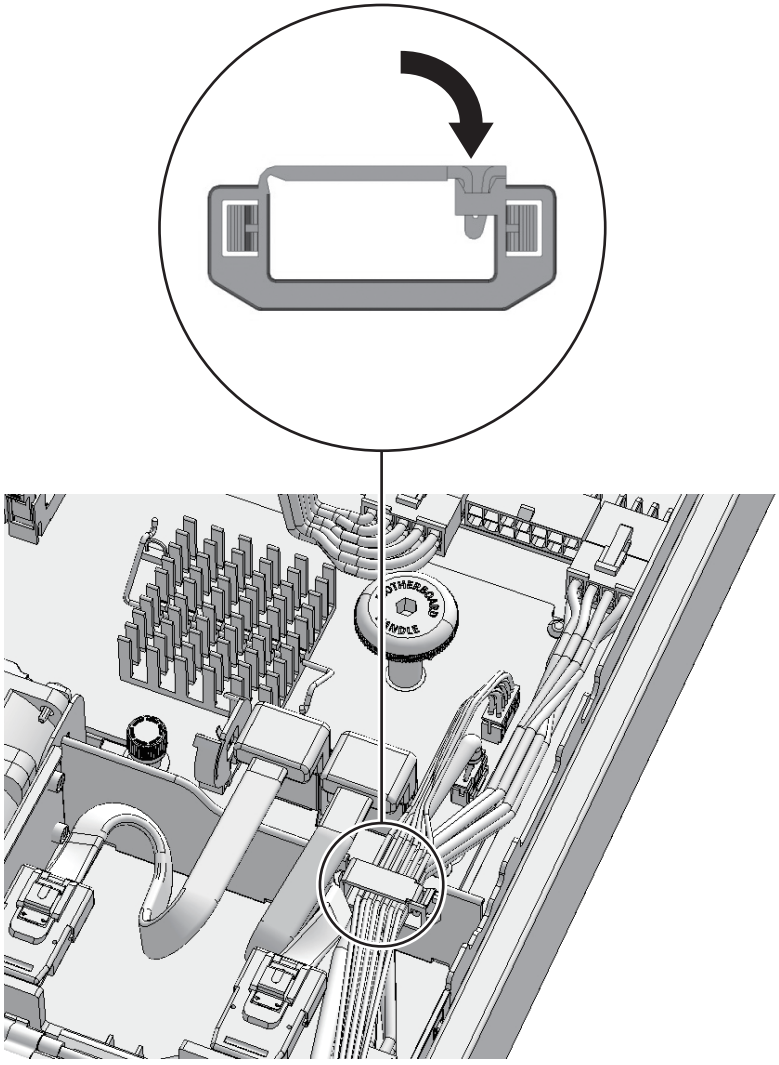
Figure 6-1 Types of cable guides



Type	How to store the cables
Type A	Working from the upper part of the cable guide, store the cables in the guide by pushing them down.
Type B	Store the cables in the cable guide and lock it.

1. **Lock the cable guide after storing the connected cables in the guide.**

Figure 6-2 Locking the cable guide



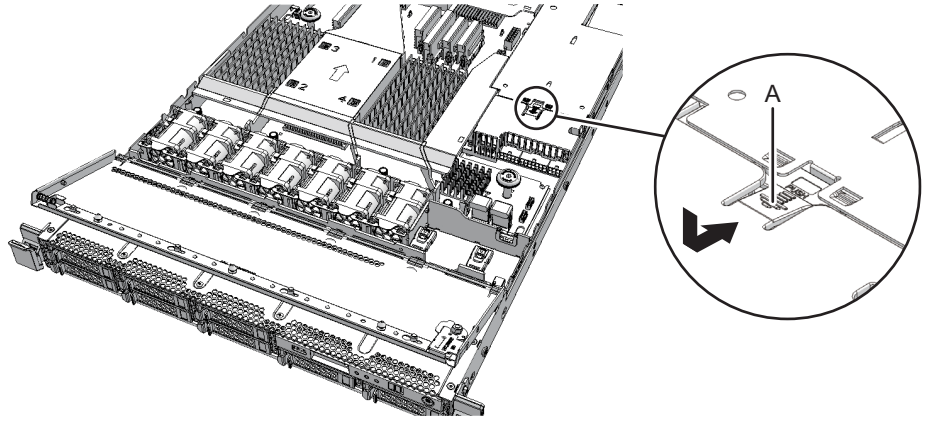
6.3.2 Installing the air duct and PSU backplane cover

If maintenance was performed on the motherboard unit, memory, or PSU backplane, install the air duct and PSU backplane cover.

1. **Install the PSU backplane cover by tilting it, inserting the latch (A in the figure), and sliding the cover to the rear of the chassis.**

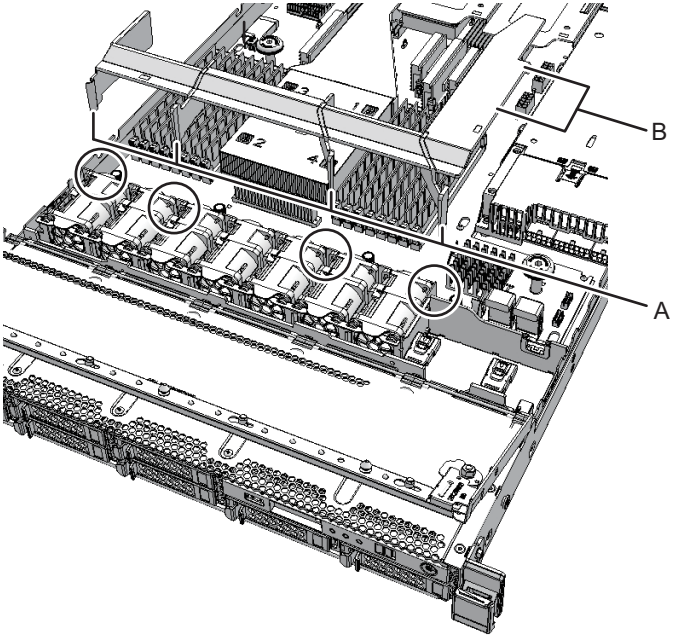
Note - Check that the latch of the PSU backplane cover is secured.

Figure 6-3 Installing the PSU backplane cover



2. **Attach the air duct vertically.**
   Fit the air duct guides (four positions) (A in the figure) into the notches on the motherboard unit, and then fix them with the pins (two positions) (B in the figure).

Figure 6-4 Installing the air duct



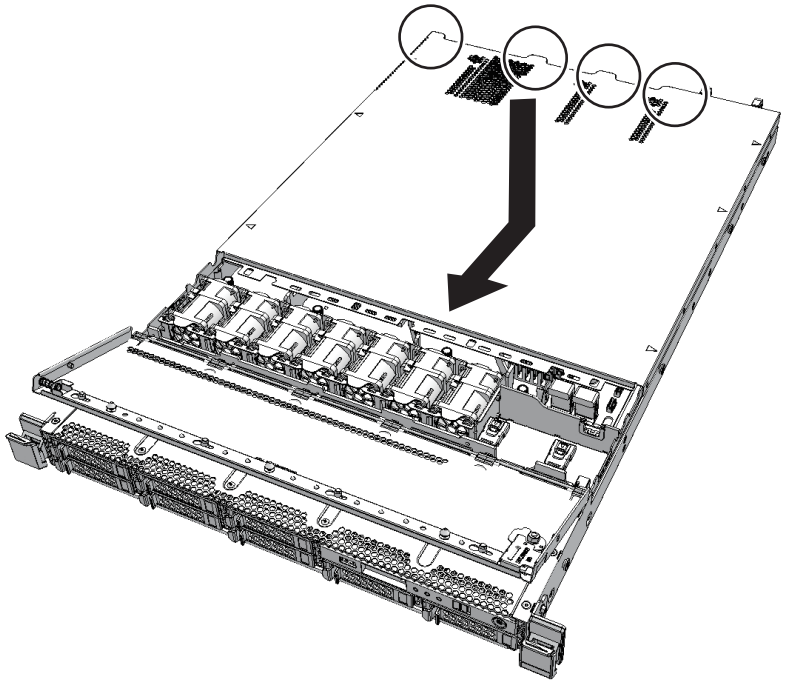
6.3.3 Installing the upper cover

If the maintenance was performed on an internal component of a chassis, install the upper cover.

1. **Install the upper cover by sliding it toward the front of the chassis.**

Note - Check that the pins on the rear of the chassis (four positions) are inserted into the upper cover.

Figure 6-5 Installing the upper cover



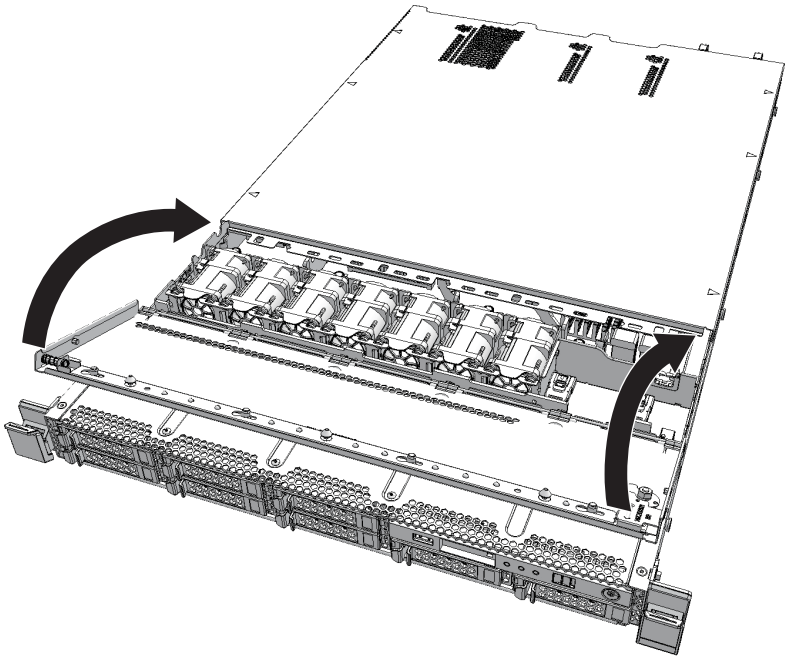
6.3.4 Closing the fan cover

If the maintenance was performed on an internal component of a chassis, install the upper cover, and then close the fan cover.

1. **Hold the edge of the fan cover, and close it while pressing the green slide button toward the inside of the chassis.**

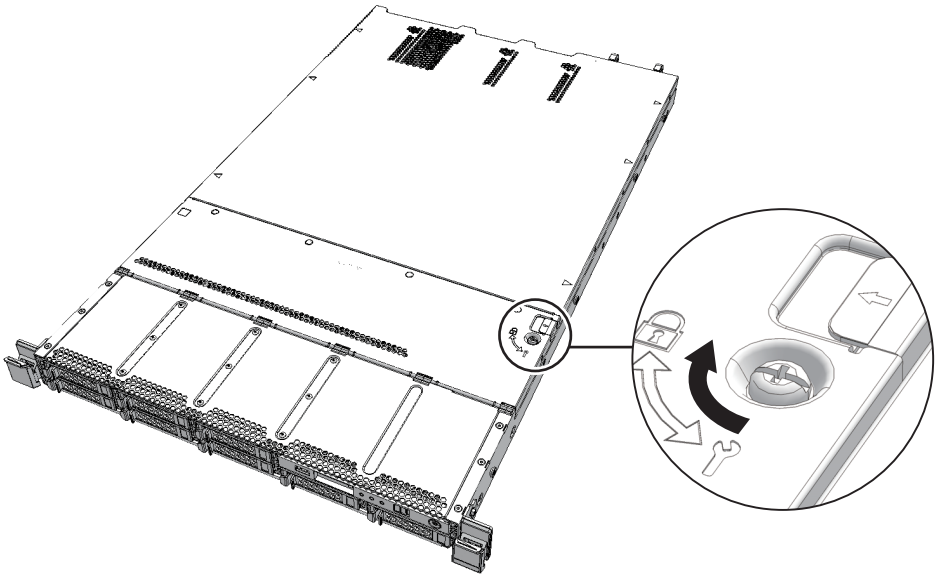
Note - Check that the fan cover is firmly closed and secured.

Figure 6-6 Fan cover



2. **Turn the locking screw to the Locked position (🔒) to lock.**

Figure 6-7 Fixing with the locking screw



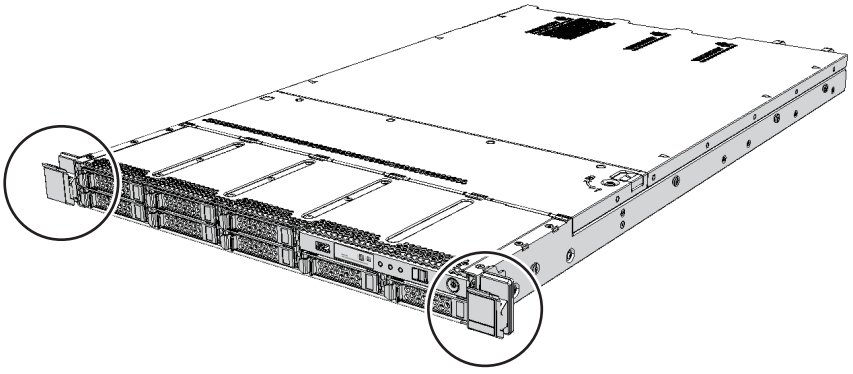
6.3.5 Putting the chassis into the rack

If the maintenance was performed on an internal component of a chassis, install the upper cover, close the fan cover, and then put the chassis back into the rack.

1. **Carefully push the chassis all the way into the rack.**

Note - Check that the chassis is securely mounted and that all the levers are locked.

Figure 6-8 Levers on chassis

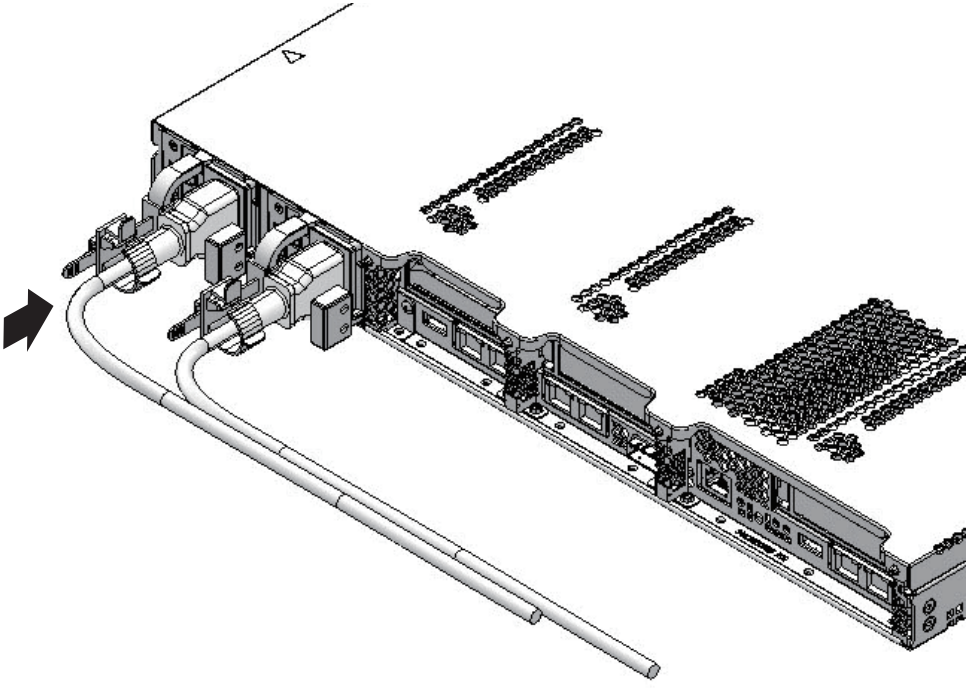


6.3.6 Installing the power cords

If the power cord has been removed for maintenance, reinstall the power cord, and then replace the cable clamp.

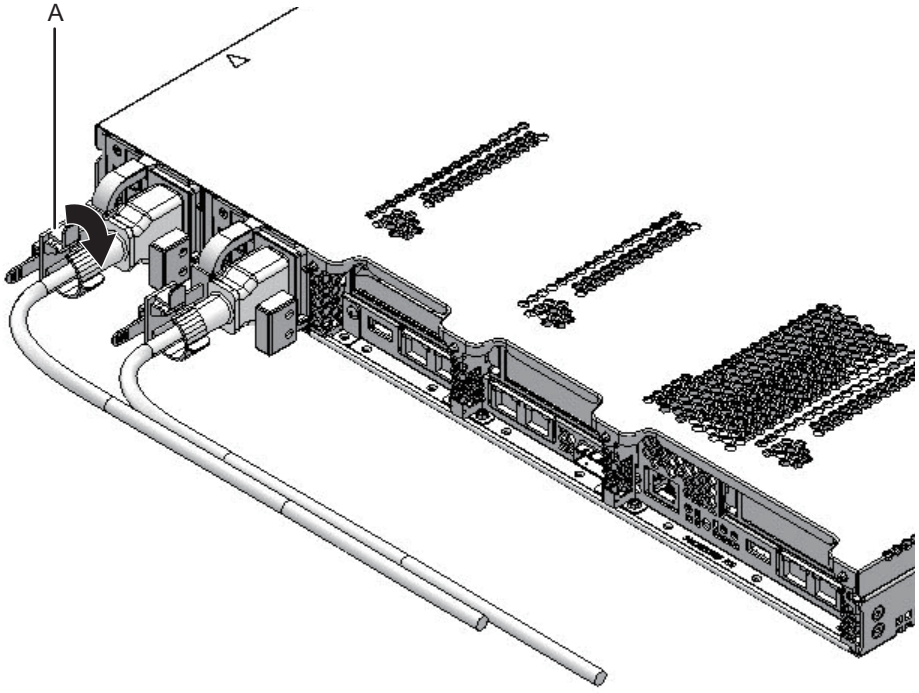
1. **Install the power cord in the power supply unit.**

Figure 6-9 Installing the power cord



2. **Clip the power cords with the cable clamp, and secure the cable clamp.**
   Lock the latch (A in the figure) and then push the cable clamp toward the front of the chassis to firmly secure the cable clamp.

Figure 6-10 Locking the cable clamp



Chapter 7

Maintaining the Motherboard Unit

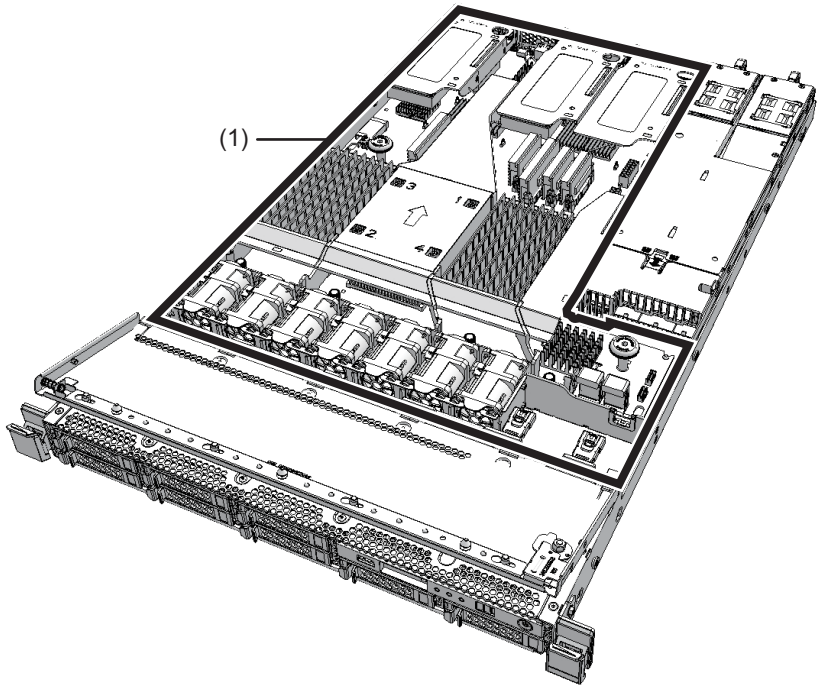
This chapter describes the procedures for maintaining the motherboard unit.

- Location of the Motherboard Unit
- Before Maintaining the Motherboard Unit
- Preparing the Motherboard Unit for Removal
- Removing the Motherboard Unit
- Switching the microSD Card
- Installing the Motherboard Unit
- Restoring the System

7.1 Location of the Motherboard Unit

This section explains the location of the motherboard unit.
A single motherboard unit is mounted in each chassis.

Figure 7-1 Location of the motherboard unit



Location number	Component
1	Motherboard unit (MBU)

7.2 Before Maintaining the Motherboard Unit

This section describes the types of maintenance performed on the motherboard unit, the maintenance flow, and the precautions to be taken.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

7.2.1 Types of maintenance

Table 7-1 lists the types of maintenance to be performed on the motherboard unit. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 7-1 Types of maintenance performed on the motherboard unit

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
-	-	OK

7.2.2 Flow of maintenance

Table 7-2 shows the maintenance procedure for the motherboard units. See the relevant section.

Table 7-2 Flow of maintenance

Task		Replacement
1	Preparation	7.3
2	Removal of the motherboard unit	7.4
3	Switching of the microSD card	7.5 (*)
4	Installation of the motherboard unit	7.6
5	System restoration	7.7

* You can revert to the same firmware version as that used before the replacement, by using the microSD card used before the replacement. (This is not a required procedure.)

7.2.3 Precautions for replacement

Note the following points when replacing the motherboard unit.

- Do not replace the motherboard unit and the PSU backplane at the same time. If you replace the motherboard unit and the PSU backplane at the same time, the system may fail to operate correctly. Replace the motherboard unit or the PSU backplane, and then execute the showhardconf or showstatus command to verify that the replaced Field Replaceable Unit (FRU) is fully operational. Then, replace the other FRU.
- The CPU and XSCF on the motherboard unit cannot be replaced individually. Replace the motherboard unit.
- When replacing the motherboard unit, the memory should be removed from the old unit and remounted on the new unit. Always mount the memory modules in the same locations as they were mounted on the old motherboard unit.

- Before replacing the motherboard unit, execute the dumpconfig command to save the system setting information. When the motherboard unit is replaced, the CPU Activation setting information and CPU Activation key may be deleted. To restore the CPU Activation setting information and CPU Activation key that have been saved with the dumpconfig command, execute the restoreconfig command. For details, see "10.10 Saving/Restoring XSCF Setting Information" in the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.
- Set the system time.
  After replacement of the motherboard unit has been completed, set the system time. For details of the setting method, see "3.6.6 Configuring the system time" in the *SPARC M10 Systems System Operation and Administration Guide*.
- Check the XCP version.
  If you replace the motherboard unit and switch the microSD card, the CMU firmware versions displayed for the current and reserve XCPs by the version command do not match when you check the XCP firmware version after executing the testsb command. This does not affect system operation. If you start the system when the current and reserve XCPs have been switched, the CMU firmware stored on the microSD card is automatically applied.
- The type of motherboard unit varies depending on the number of CPU clocks.

7.3 Preparing the Motherboard Unit for Removal

This section explains the preparations that must be completed prior to removing the motherboard unit. The preparation procedure is same regardless of whether the system is configured with or without a hardware RAID.

Caution - To completely shut down the system, all the power cords must be removed. If the power cords are not removed, an electrical failure may occur.

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the motherboard unit requiring maintenance.**

```
XSCF> showlogs error
```

   For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**

For details, see "5.2 Stopping the System."

6. **Remove all the power cords from the power supply unit.**
   For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

7.4 Removing the Motherboard Unit

This section describes the procedure for removing the motherboard unit.
Enable removal of the motherboard unit prior to attempting to remove it. For details, see "7.3 Preparing the Motherboard Unit for Removal."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

7.4.1 Accessing the motherboard unit

1. **Remove all the cables connected to the external interface.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

---

2. **Pull the chassis out of the rack.**
   For details, see "5.3.2 Pulling the chassis out from the rack."
3. **Open the fan cover.**
   For details, see "5.3.3 Opening the fan cover."
4. **Remove the upper cover.**
   For details, see "5.3.4 Removing the upper cover."
5. **Remove the air duct and the PSU backplane cover.**
   For details, see "5.3.5 Removing the air duct and PSU backplane cover."
6. **Remove all the fan units.**
   For details, see "10.4.2 Removing a fan unit."

Note - Make a note of the positions of the fan units before removing them to ensure that they are reinstalled correctly.

---

7. **Remove all the PCI Express (PCIe) risers.**
   For details, see "12.4.2 Removing a PCI Express riser."

   Removing the PCIe risers enables you to easily remove the cables from the PSU backplane.

Note - Make a note of the mounting positions of the PCIe risers before removing them to ensure that they are reinstalled correctly.

7.4.2 Removing the motherboard unit

Caution - Remove all the memory before removing the motherboard unit. Otherwise, the memory may be damaged.

1. **Remove all the memory.**
   For details, see "8.5.2 Removing memory."

Note - Make a note of the mounting positions of the memory modules before removing them to ensure that they are reinstalled correctly.

2. **Release the cable lock guide.**
   For details, see "5.3.6 Releasing the cable guide lock."

   If the cable guide does not have a lock, proceed to step 3.

3. **Remove the cables connected to the motherboard unit.**
   The following cables should be removed:

   a. Three (3) cables on the motherboard unit that connect the PSU backplane to the motherboard unit

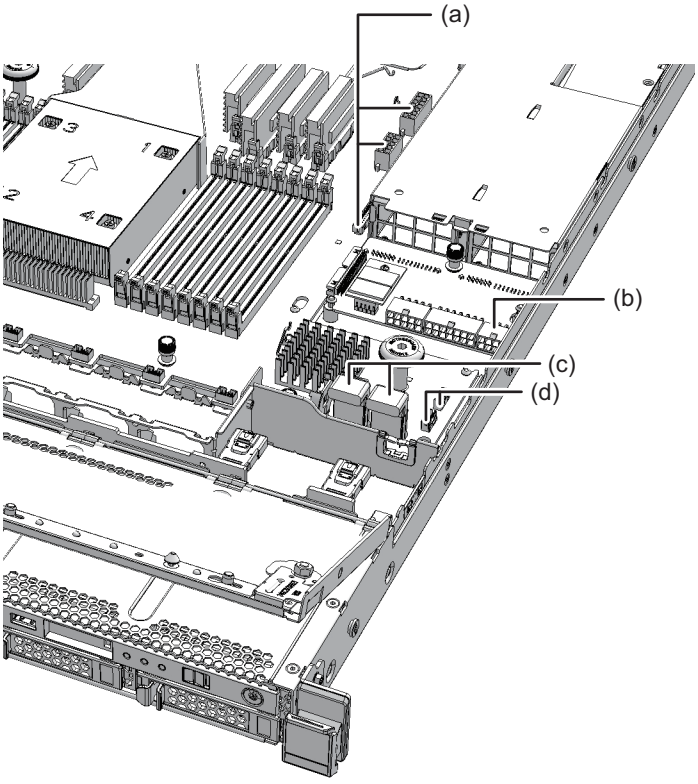
   b. One (1) cable that connects the PSU backplane to the HDD backplane
      The cable does not have to be removed from the HDD backplane.

   c. Two (2) cables that connect the HDD backplane to the motherboard unit

   d. Two (2) cables that connect the operation panel to the motherboard unit

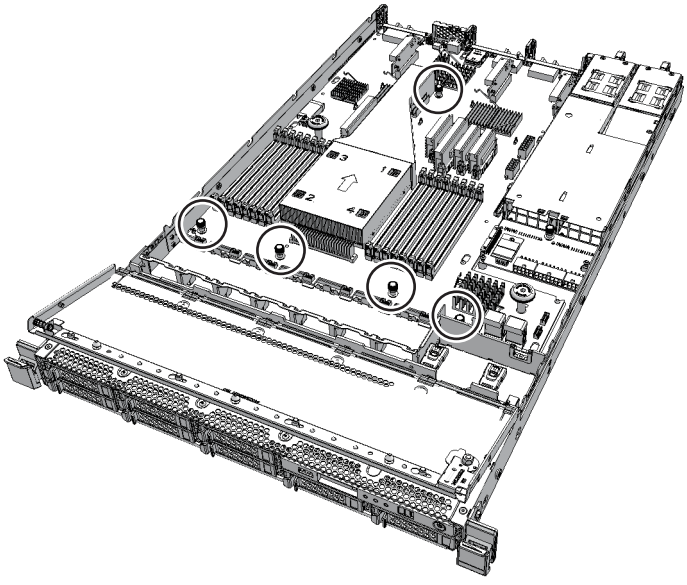
Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

Figure 7-2 Cables of the motherboard unit



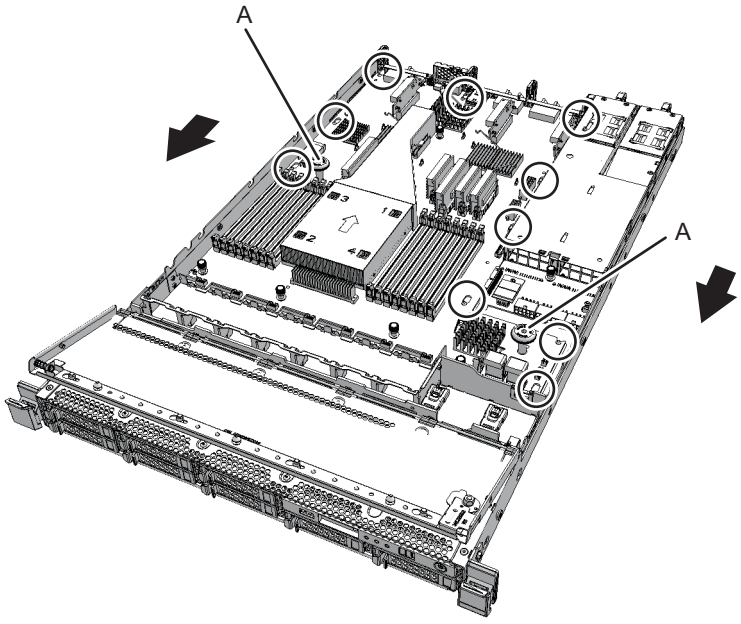
4. **Loosen the five (5) screws securing the motherboard unit.**

Figure 7-3 Screws on the motherboard unit



5. **Hold the handles (A in the figure) of the motherboard unit and slide it out toward the front of the chassis.**
   Check that the motherboard unit is disengaged from the 10 fixing pins.

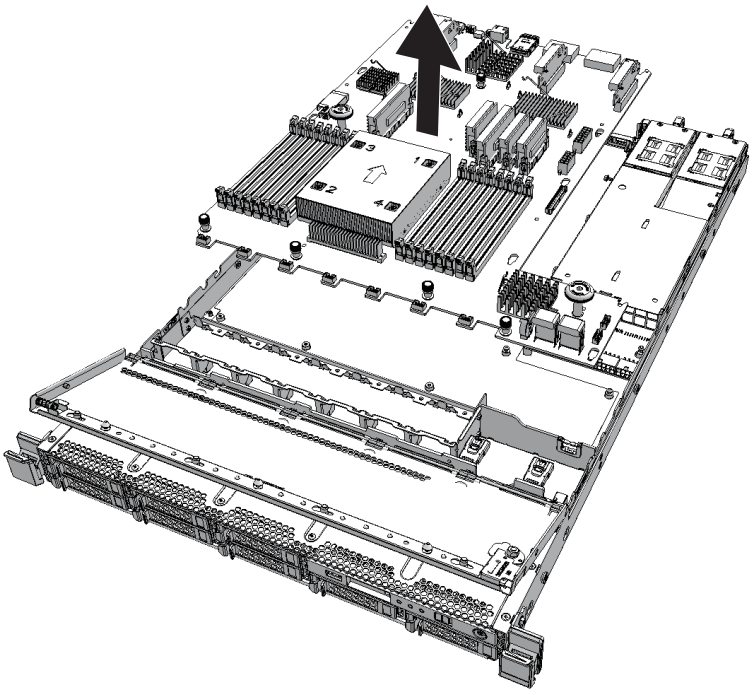
Figure 7-4 Motherboard unit fixing pins



6. **Pull up the motherboard unit to remove it.**

Note - Place the removed motherboard unit on the grounded antistatic ESD mat.

Figure 7-5 Removal of the motherboard unit



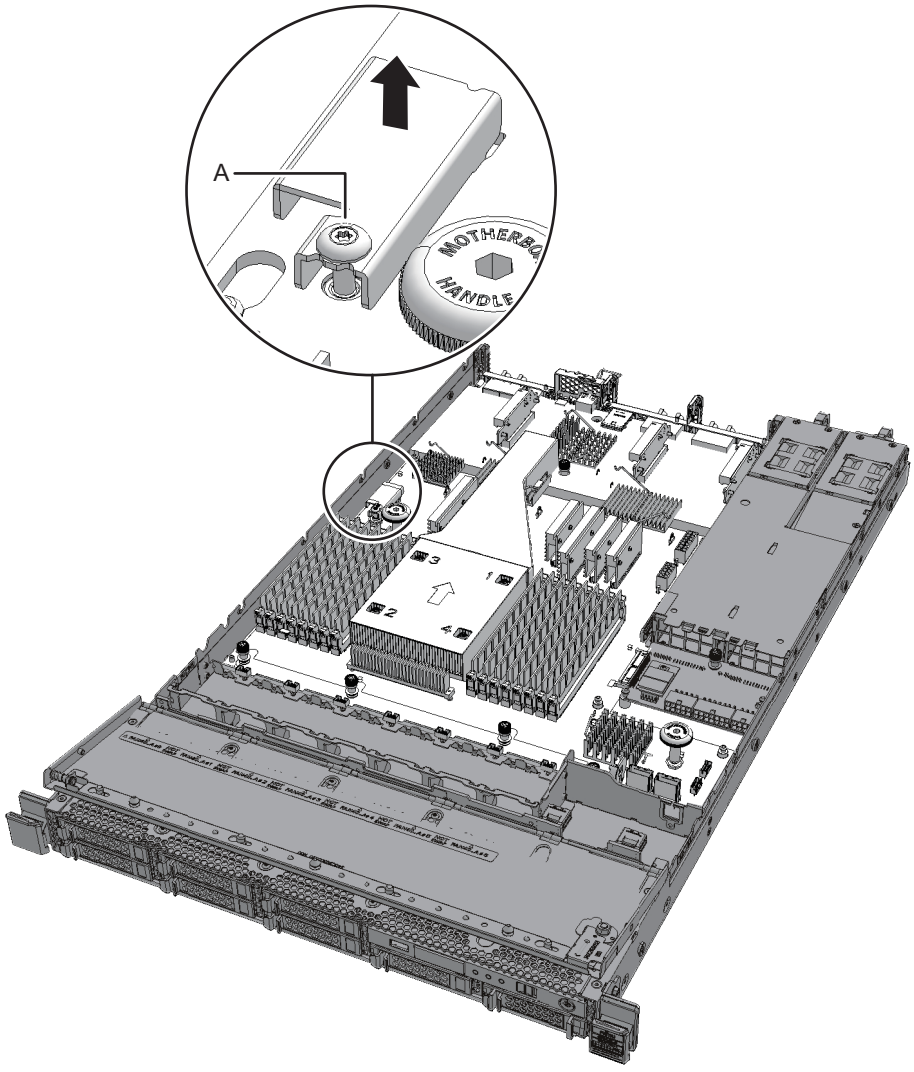
7.5 Switching the microSD Card

If you replace the motherboard unit, the firmware version may be different from that used before the replacement. To use the same firmware version as that used before the replacement, remove the microSD card from the motherboard unit being replaced, and install it on the replacement motherboard unit.

Note - Use a Torx screwdriver (T10).

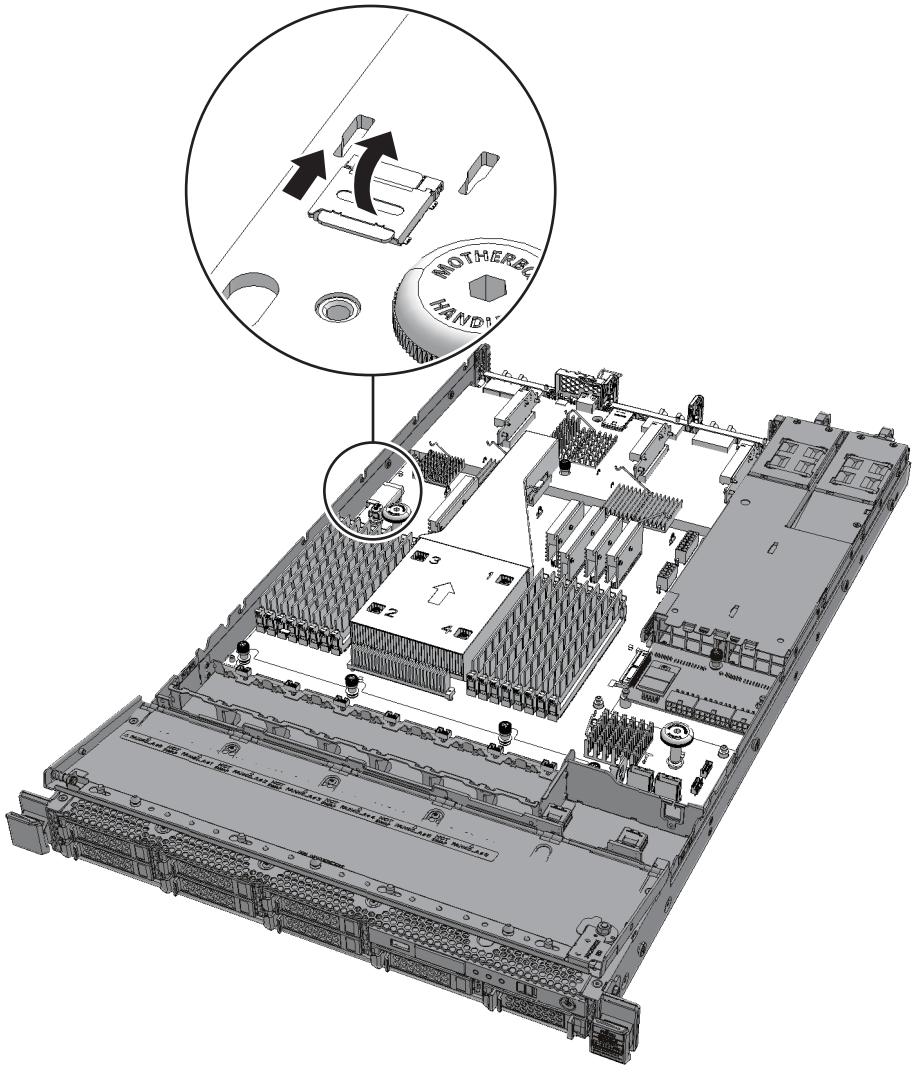
1. **Remove the screw (A in the figure) that secures the cover of the microSD card fixed to the removed motherboard unit, and then remove the cover.**

Figure 7-6 Removing the cover



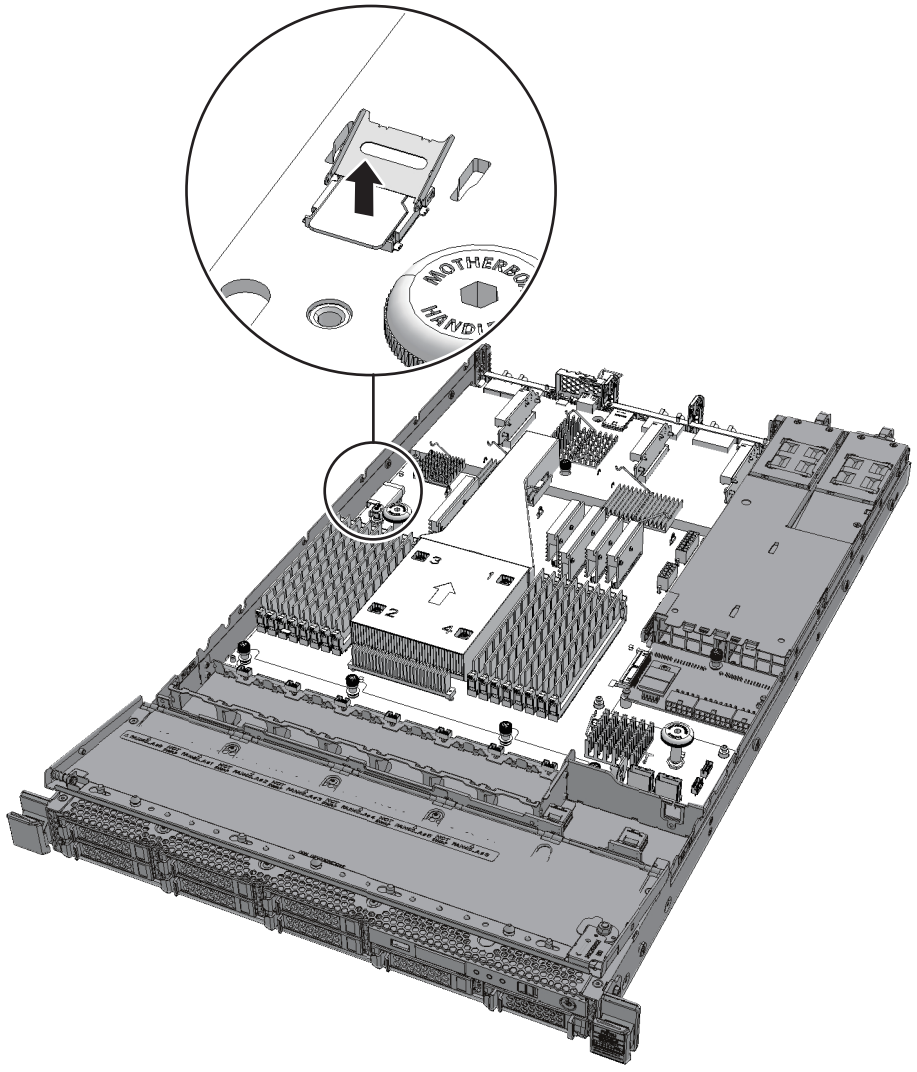
2. **Open the microSD card cover by sliding it toward the rear of the chassis.**

Figure 7-7 Unlocking the cover



3. **Remove the microSD card.**

Figure 7-8 Removing the microSD card



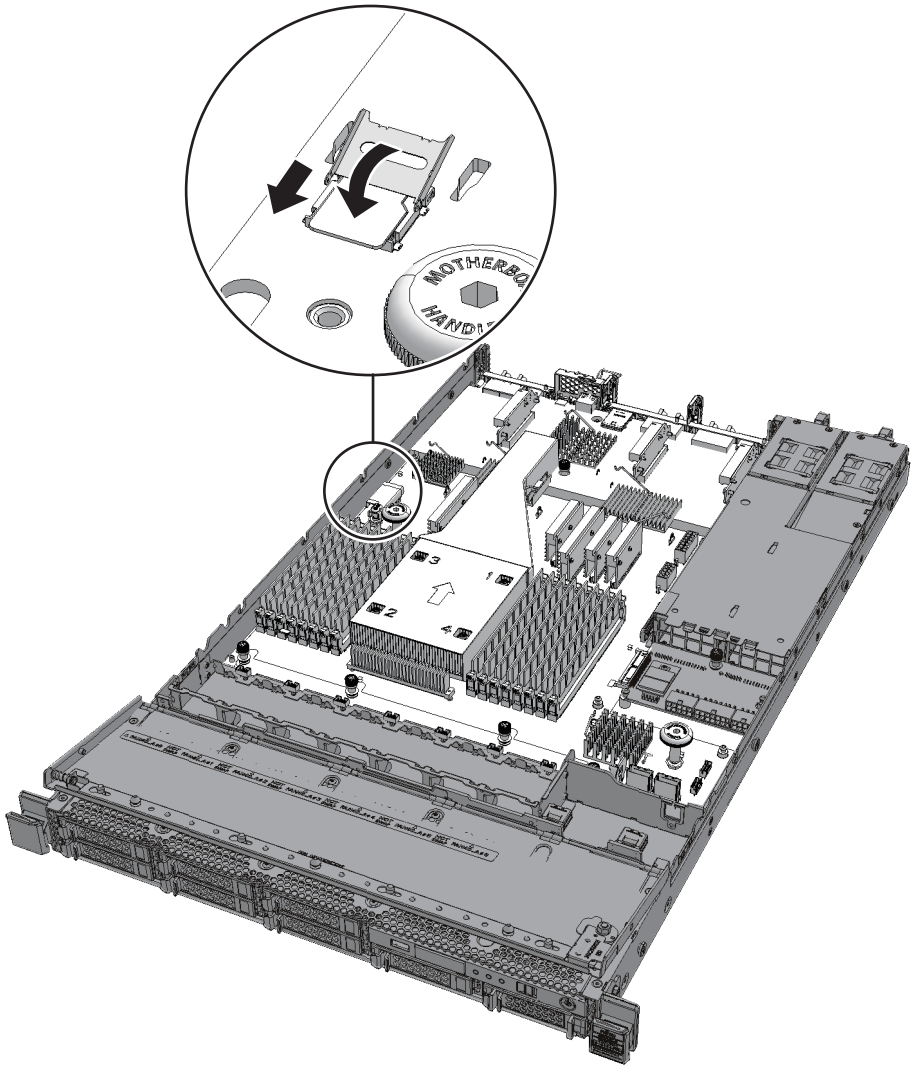
4. **Remove the microSD card in the new motherboard unit.**
   Perform the same procedure as steps 1 to 3.
5. **Place the microSD card that was removed in step 3 into the microSD card slot of the new motherboard unit by aligning it with the shape of the connector.**

Note - Place the microSD card in the connector, with the terminal side of the card facing down.

---

6. **Close the microSD card cover, and lock it by sliding it toward the front of the chassis.**

Figure 7-9 Locking the cover



7. **Install the microSD card cover, and then secure it with the screw.**

Note - Return the microSD card that was supplied with the new motherboard unit by installing it in the removed motherboard unit.

7.6 Installing the Motherboard Unit

This section describes the procedure for installing the motherboard unit.

7.6.1 Installing the motherboard unit

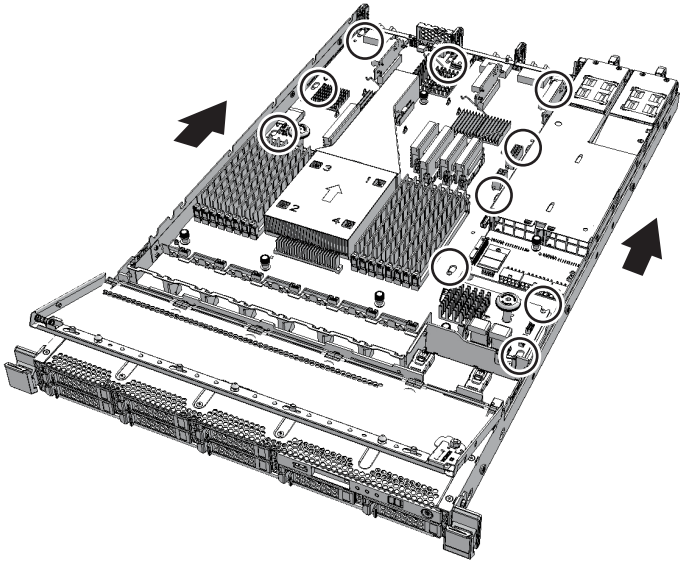
Note - Be careful not to damage the connectors when installing the motherboard unit in the chassis.

1. **Install the removed memory on the new motherboard unit.**

Note - Install the memory modules in the correct positions by referring to the notes you made before the start of maintenance.

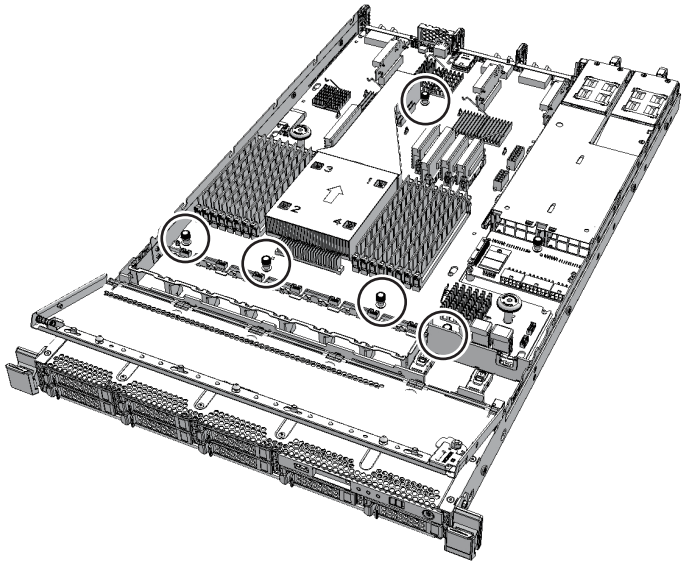
2. **Hold the handles on the motherboard unit and install the motherboard unit in the chassis.**
   Install it from the front of the chassis, aligning it with the mounting position.
3. **Confirm that the 10 fixing pins are inserted into the motherboard unit, and then slide the motherboard unit toward the rear of the chassis.**

Figure 7-10 Motherboard unit fixing pins



4. **Tighten the five (5) screws securing the motherboard unit.**

Figure 7-11 Screws on the motherboard unit

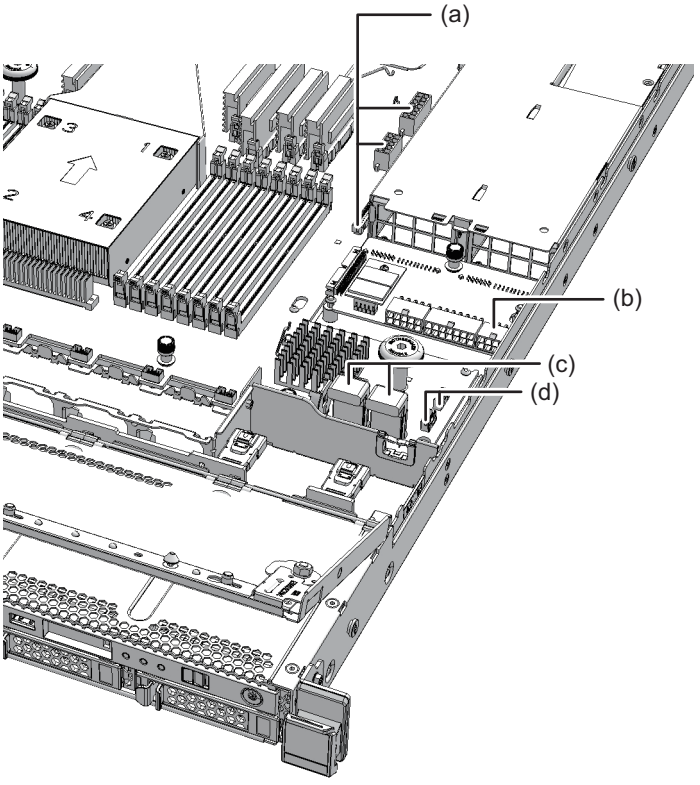


5. **Connect the cables to the motherboard unit.**
   The following cables are to be installed:
   a. Three (3) cables on the motherboard unit that connect the PSU backplane to the motherboard unit
   b. One (1) cable that connects the PSU backplane to the HDD backplane Connect the cable to the PSU backplane.
   c. Two (2) cables that connect the HDD backplane to the motherboard unit
   d. Two (2) cables that connect the operation panel to the motherboard unit

---

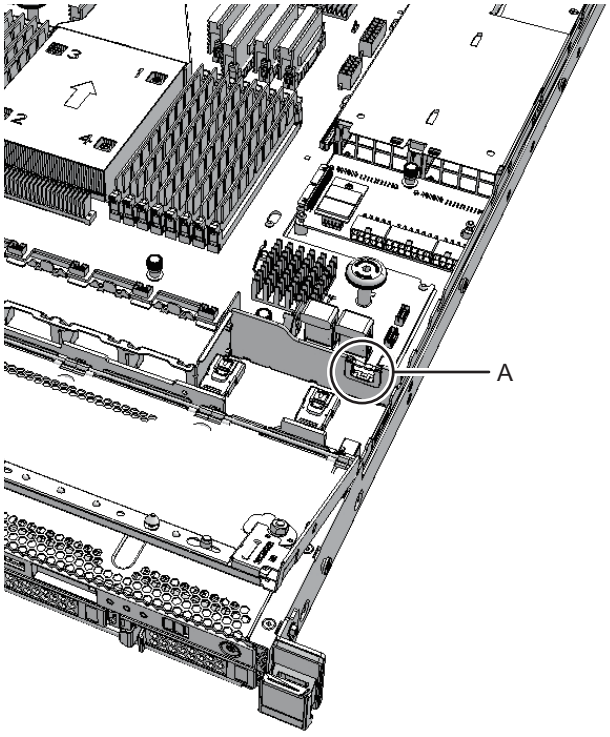
Note - Install the cables in the correct positions by referring to the notes that you made before the start of maintenance.

Figure 7-12 Cables of the motherboard unit



6. **Store the cables of the motherboard unit in the cable guide (A in the figure).**

Figure 7-13 Location of the cable guide

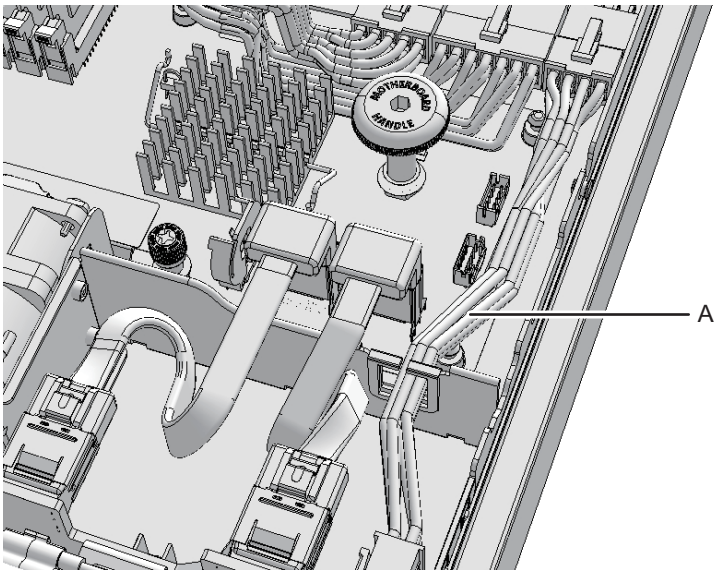


There are two types of cable guides. The procedure varies depending on the type. For the types of cable guides, see Figure 6-1.

Type A

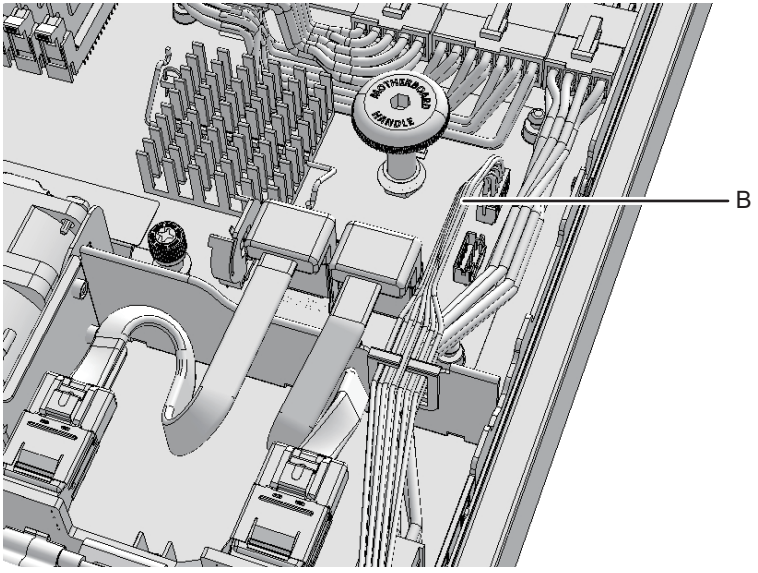
a. Working from the upper part of the cable guide, store the cable (red/black) (A in the figure) connecting the HDD backplane to the PSU backplane in the guide.

Figure 7-14 Storing cables (red/black)



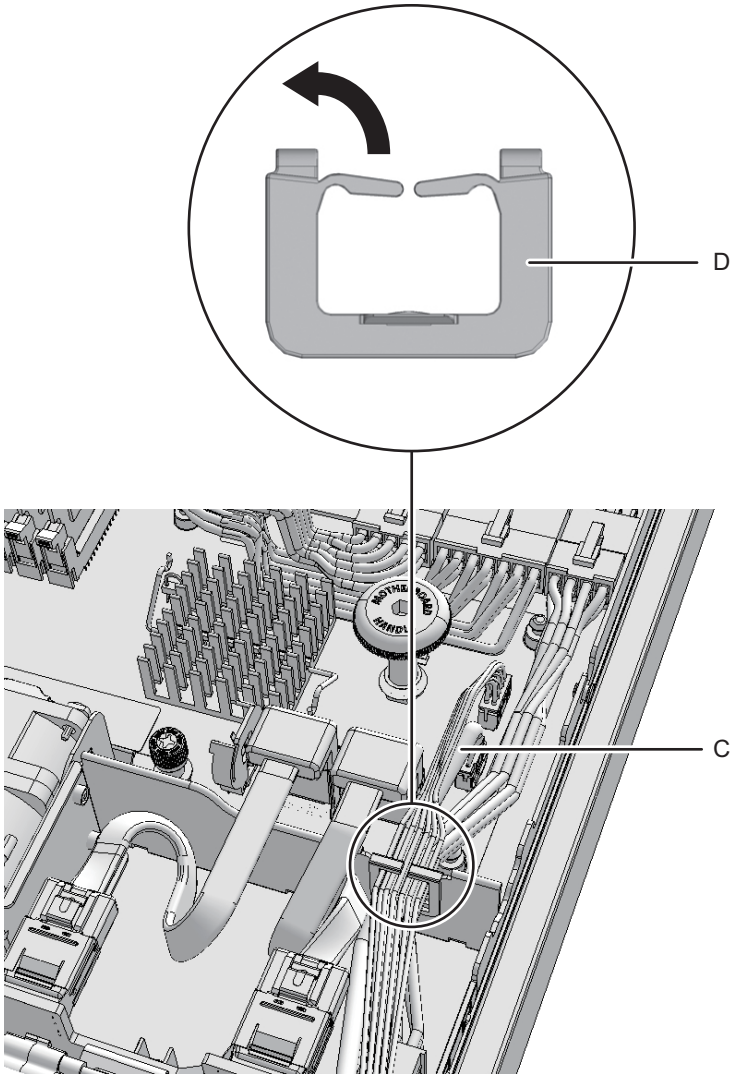
b. Store in the cable guide the cable (black/yellow/white) (B in the figure) connecting the operation panel to the motherboard unit.

Figure 7-15 Storing cables (black/yellow/white)



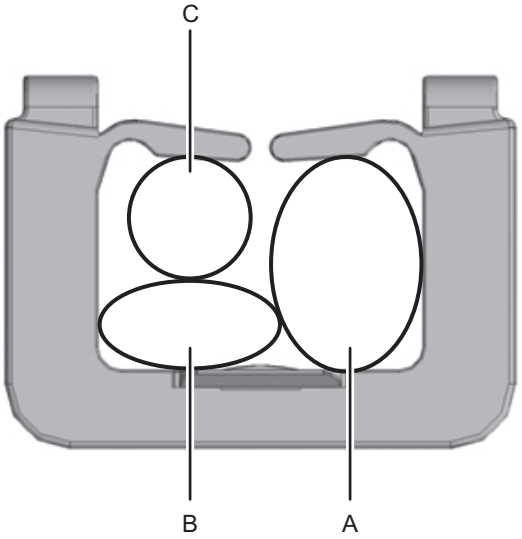
c. From the middle of the clamp in the upper part of the cable guide, pull up one side of the clamp to open it (D in the figure). Then, store in the cable guide the cable (black) (C in the figure) connecting the operation panel to the motherboard unit.

Figure 7-16 Storing a cable (black)



d. Confirm that three cables are stored in the cable guide.
A in the figure: The cable (red/black) connecting the PSU backplane to the HDD backplane
B in the figure: The cable (black/yellow/white) connecting the operation panel to the motherboard unit
C in the figure: The cable (black) connecting the operation panel to the motherboard unit

Figure 7-17 Cable guide after the cables are stored as viewed from the front of the chassis



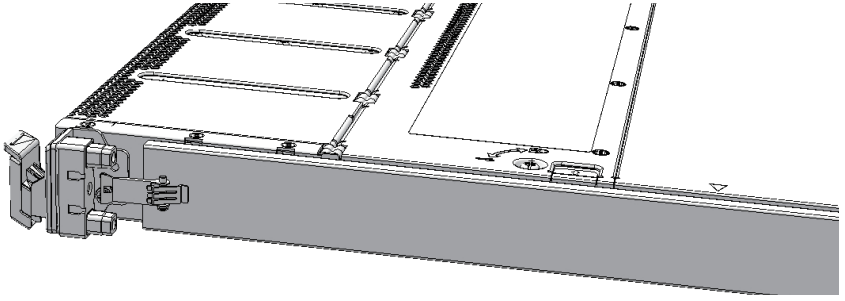
Type B

a. Store in the cable guide one cable (red/black) connecting the PSU backplane to the HDD backplane and two cables (black and black/yellow/white) connecting the operation panel to the motherboard unit.

b. Lock the cable guide.
For details, see "6.3.1 Locking the cable guide."

7. **Close the fan cover.**
Make sure that each cable does not interfere with the fan unit cover.

Figure 7-18 State where the fan unit cover is closed



7.6.2 Restoring the chassis

1. **Install all the PCIe risers.**

For details, see "12.5.1 Installing a PCI Express card."

Note - Install the PCIe risers in the correct positions by referring to the notes that you made before the start of maintenance.

2. **Install all the fan units.**
   For details, see "10.5.1 Installing a fan unit."

Note - Install the fan units in the correct positions by referring to the notes that you made before the start of maintenance.

3. **Install the air duct and the PSU backplane cover.**
   For details, see "6.3.2 Installing the air duct and PSU backplane cover."
4. **Install the upper cover.**
   For details, see "6.3.3 Installing the upper cover."
5. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
6. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
7. **Connect all the cables of the external interface.**

Note - Install the cables in the correct positions by referring to the notes that you made before the start of maintenance.

8. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

7.7 Restoring the System

This section describes the procedure for restoring the system after reinstalling the motherboard unit. The restoration procedure varies depending on whether the system is configured with or without a hardware RAID.

When the system is configured without a hardware RAID

1. **Check that the XSCF STANDBY LED on the operation panel is on.**
2. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."

3. **Log in to the XSCF shell.**
4. **Execute the version command to confirm the firmware version information.**
   If the XCP firmware version does not match that used before the replacement, update the firmware.

   For details, see "16.1.3 Updating firmware" in the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.

   If you replace the microSD card, the CMU firmware versions do not match. However, you do not need to perform an update.

   The following example shows "02.01.0001" (*1 in the execution example) as the CMU firmware version of the current XCP, and "02.00.0006" (*2 in the execution example) as the CMU firmware version of the reserve XCP. Thus, you can see that the CMU firmware versions do not match.

```
XSCF> version -c xcp -v
BB#00-XSCF#0 (Master)
XCP0 (Current): 2011
CMU           : 02.01.0001 (*1)
    POST          : 1.20.0
    OpenBoot PROM : 4.34.0+1.2.0
    Hypervisor    : 0.21.11
XSCF          : 02.01.0001
XCP1 (Reserve): 2011
CMU           : 02.00.0006 (*2)
    POST          : 1.13.0
    OpenBoot PROM : 4.34.0+1.0.5
    Hypervisor    : 0.21.3
XSCF          : 02.01.0001
CMU BACKUP
#0: 02.01.0001
#1: ..
XSCF>
```

5. **Execute the setdate command to set the XSCF time.**
   Specify the time in either of the following formats:

   yyyy.MM.DD-hh:mm:ss year.month.day-hour (24-hour clock):minute:second

   MMDDhhmmyyyy.ss monthdayhour (24-hour clock) minuteyear.second

   In the following example, "October 20, 2013 16:59:00" is specified.

```
XSCF> setdate -s 102016592013.00
```

6. **Start the system.**
   For details, see "6.2 Starting the System."
7. **Close the rack door.**

When the system is configured with a hardware RAID

1. **Check that the XSCF STANDBY LED on the operation panel is on.**
2. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
3. **Log in to the XSCF shell.**
4. **Execute the version command to confirm the firmware version information.**
   If the XCP firmware version does not match that used before the replacement, update the firmware.

   For details, see "16.1.3 Updating firmware" in the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.

   If you replace the microSD card, the CMU firmware versions do not match. However, you do not need to perform an update.

   The following example shows "02.01.0001" (*1 in the execution example) as the CMU firmware version of the current XCP, and "02.00.0006" (*2 in the execution example) as the CMU firmware version of the reserve XCP. Thus, you can see that the CMU firmware versions do not match.

```
XSCF> version -c xcp -v
BB#00-XSCF#0 (Master)
XCP0 (Current): 2011
CMU           : 02.01.0001 (*1)
    POST          : 1.20.0
    OpenBoot PROM : 4.34.0+1.2.0
    Hypervisor    : 0.21.11
XSCF          : 02.01.0001
XCP1 (Reserve): 2011
CMU           : 02.00.0006 (*2)
    POST          : 1.13.0
    OpenBoot PROM : 4.34.0+1.0.5
    Hypervisor    : 0.21.3
XSCF          : 02.01.0001
CMU BACKUP
#0: 02.01.0001
#1: ..
XSCF>
```

5. **Execute the setdate command to set the XSCF time.**
   Specify the time in either of the following formats:

   yyyy.MM.DD-hh:mm:ss year.month.day-hour (24-hour clock):minute:second

   MMDDhhmmyyyy.ss monthdayhour (24-hour clock) minuteyear.second

   In the following example, "October 20, 2013 16:59:00" is specified.

```
XSCF> setdate -s 102016592013.00
```

6. **Execute the setpparparam command to suppress auto-boot.**

```
XSCF> setpparparam -p 0 -s bootscript "setenv auto-boot false"
```

7. **Start the system.**
   For details, see "6.2 Starting the System."
8. **The ok prompt appears.**
9. **Enable the RAID volume to check the status.**
   For details, see "14.2.11 Re-enabling a hardware RAID volume" in the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.
10. **Close the rack door.**

Chapter 8

Maintaining Memory

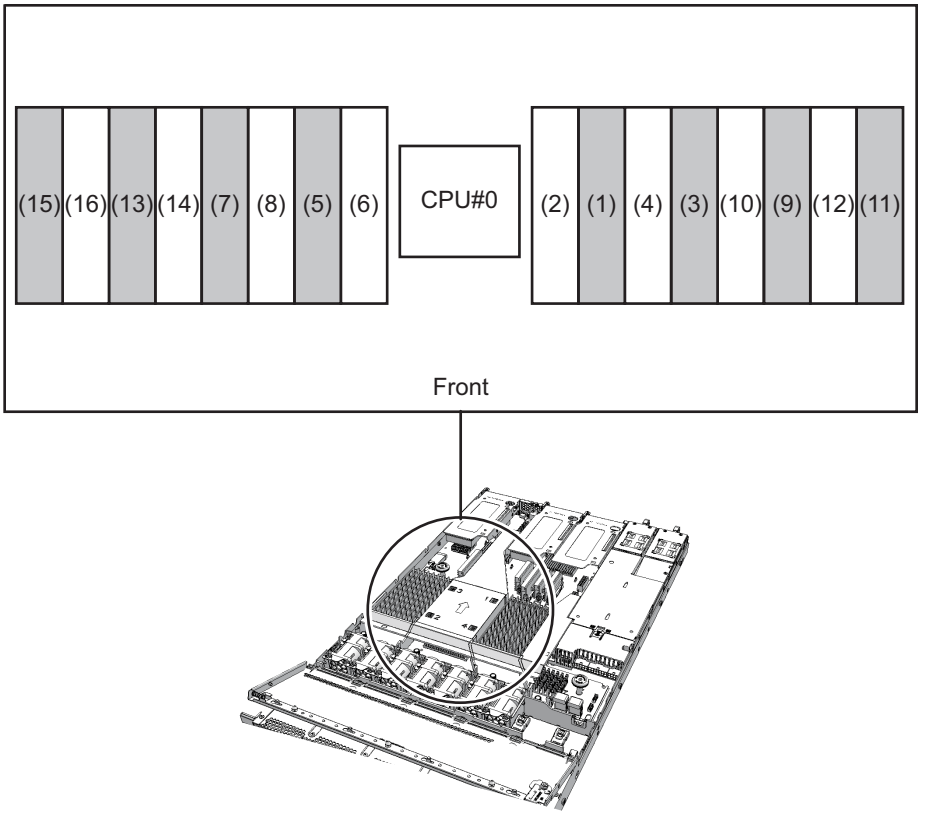
This chapter describes the memory maintenance procedures. Memory can be replaced, installed, and removed.

- Memory Configuration
- Checking the Memory Configuration Rules
- Before Maintaining Memory
- Enabling the Removal of Memory
- Removing Memory
- Installing Memory
- Restoring the System

8.1 Memory Configuration

This section describes the configuration and location of memory.
Memory is installed on a motherboard unit and divided into group A and group B. Up to eight memory modules can be installed for each group, up to a total of 16 memory modules.

Figure 8-1 Memory position



Location number	Component	Group
1	Memory (MEM#00A)	A
2	Memory (MEM#00B)	B
3	Memory (MEM#01A)	A
4	Memory (MEM#01B)	B
5	Memory (MEM#02A)	A
6	Memory (MEM#02B)	B
7	Memory (MEM#03A)	A
8	Memory (MEM#03B)	B
9	Memory (MEM#10A)	A
10	Memory (MEM#10B)	B
11	Memory (MEM#11A)	A
12	Memory (MEM#11B)	B
13	Memory (MEM#12A)	A

Location number	Component	Group
14	Memory (MEM#12B)	B
15	Memory (MEM#13A)	A
16	Memory (MEM#13B)	B

8.2 Checking the Memory Configuration Rules

This section describes the memory installation rules and the method for checking memory information.

8.2.1 Memory installation rules

Install the memory in accordance with the following rules:

- Install memory in units of four or eight modules.
- When memory is installed in units of four or eight modules, install the memory modules of the same capacity and rank.
- Use either R-DIMM (Registered DIMM: 8 GB/16 GB/32 GB) memory or LR-DIMM (Load Reduced DIMM: 64 GB) memory.
- For a redundant configuration, install 8 or 16 memory modules and install the memory modules of the same capacity and rank for memory groups A and B.
- Install memory for group A first, then install memory for group B.

Figure 8-2 shows all memory installation positions. Position groups a to d indicate 4-module memory installation units. Table 8-1 and Table 8-2 list the supported memory installation configurations. Memory for group B cannot be installed until no more memory can be installed for group A.
As for the installation order of memory modules for memory group B, give priority to using either all R-DIMM or all LR-DIMM memory rather than installing them according to the memory installation configurations shown in Table 8-1 and Table 8-2.

You can set memory for each CPU when configuring memory in the mirror configuration. In such a case, mount all the memory in group A and group B for the corresponding CPU. Figure 8-2 shows a combination of mirrored memory in a unit of eight modules on each of the right and left sides.
For example, in the memory on the right side of CPU#0 in Figure 8-2, the four-module set of MEM#00B, MEM#00A, MEM#01B, and MEM#01A mirrors the four-module set of MEM#10B, MEM#10A, MEM#11B, and MEM#11A.

Figure 8-2 Memory installation positions and units

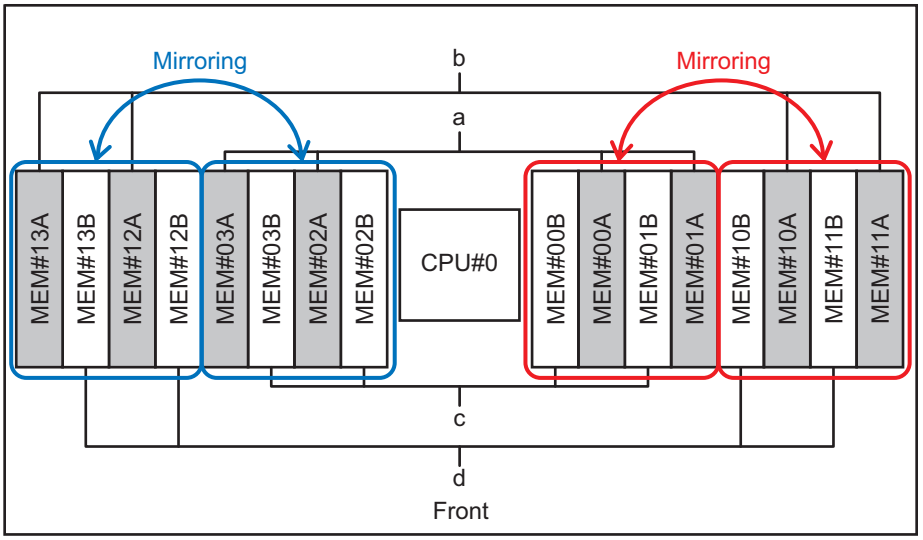


Table 8-1 Memory installation configurations (4-module units)

Memory module count	Memory installed			
4	a in Figure 8-2	-	-	-
8	a in Figure 8-2	b in Figure 8-2	-	-
12	a in Figure 8-2	b in Figure 8-2	c in Figure 8-2	-
16	a in Figure 8-2	b in Figure 8-2	c in Figure 8-2	d in Figure 8-2

Table 8-2 Memory installation configurations (8-module units)

Memory module count	Memory installed			
8	a in Figure 8-2	b in Figure 8-2	-	-
16	a in Figure 8-2	b in Figure 8-2	c in Figure 8-2	d in Figure 8-2

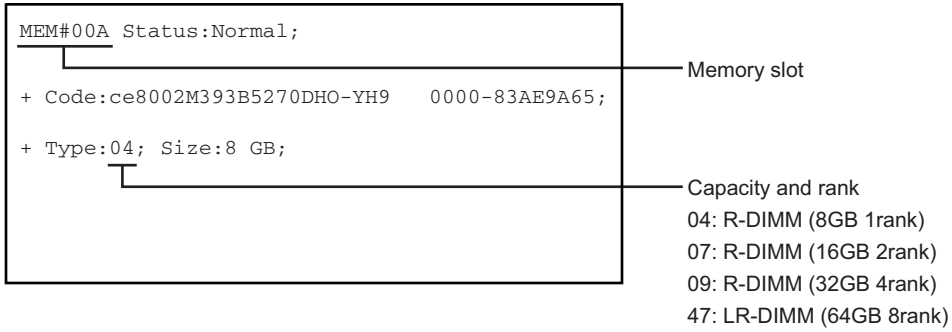
8.2.2 Checking memory information

Check the type and size of the memory by using the showhardconf command of the XSCF firmware.

1. **Log in to the XSCF shell.**
2. **Execute the showhardconf command to check the memory information.**
   The capacity and rank of the memory are displayed.

```
XSCF> showhardconf
----------------------Omitted-------------------------
    MBU Status:Normal; Ver:2086h; Serial:TZ1249M00C  ;
        + FRU-Part-Number:CA07363-D001 A0   /7060744              ;
        + Power_Supply_System: ;
        + Memory_Size:64 GB; Type: A ;
        CPU#0 Status:Normal; Ver:4142h; Serial:00325040;
            + Freq:2.800 GHz; Type:0x10;
            + Core:16; Strand:2;
        MEM#00A Status:Normal;
            + Code:2c800118KSF1G72PZ-1G6E1 4531-B1F92ED5;
            + Type:04; Size:8 GB;
        MEM#01A Status:Normal;
            + Code:2c800118KSF1G72PZ-1G6E1 4531-B1F92F0B;
            + Type:04; Size:8 GB;
        MEM#02A Status:Normal;
            + Code:2c800118KSF1G72PZ-1G6E1 4531-1A947388;
            + Type:04; Size:8 GB;
        MEM#03A Status:Normal;
            + Code:2c800118KSF1G72PZ-1G6E1 4531-1A947375;
            + Type:04; Size:8 GB;
```

Figure 8-3 How to read the memory information



8.3 Before Maintaining Memory

This section explains the types of and the procedure for memory maintenance, as well as some precautions.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

8.3.1 Types of maintenance

Table 8-3 lists the types of maintenance for the memory. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 8-3 Types of memory maintenance

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
-	-	OK

8.3.2 Flow of maintenance

Table 8-4 shows the procedure for memory maintenance. See the corresponding section and item.
The memory expansion procedure is same as the memory installation procedure. The memory reduction procedure is the same as the memory removal procedure.

Table 8-4 Flow of maintenance

Task		Replacement	Expansion	Reduction
1	Preparation	8.4	8.4	8.4
2	Memory removal	8.5	8.5.1	8.5
3	Memory installation	8.6	8.6	8.6.2
4	System restoration	8.7	8.7	8.7

8.3.3 Precautions for replacement

Observe the following when replacing memory:

- When you replace a memory module, make sure that you install the new module in the same position as the original one.

8.3.4 Precautions for expansion

Observe the following when expanding memory:

- Observe the memory installation rules when you expand memory. For details, see "8.2.1 Memory installation rules."
- When you expand the memory modules from 8 to 12 modules or from 12 to 16 modules, the physical address configurations of the memory modules are

changed. So you may need to reconfigure the logical domains.

- When you expand memory by 64 GB, apply XCP 2080 or later.

8.3.5 Precautions for removal

Note the following points when removing memory:

- Observe the memory installation rules when you reduce memory. For details, see "8.2.1 Memory installation rules."

8.4 Enabling the Removal of Memory

This section describes the preparations that must be completed prior to memory removal.

Caution - To completely shut down the system, all the power cords must be removed. If the power cords are not removed, an electrical failure may occur.

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the memory requiring maintenance.**

```
XSCF> showlogs error
```

For details, see "3.3.5 Checking log information."

Note - When expanding or reducing memory, check that no error has occurred.

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
   For details, see "5.2 Stopping the System."
6. **Remove all the power cords from the power supply unit.**
   For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

8.5 Removing Memory

This section describes the procedure for memory removal. Perform reduction using the same procedure.
Enable removal of the memory before you attempting to remove it. For details, see "8.4 Enabling the Removal of Memory."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

8.5.1 Accessing memory

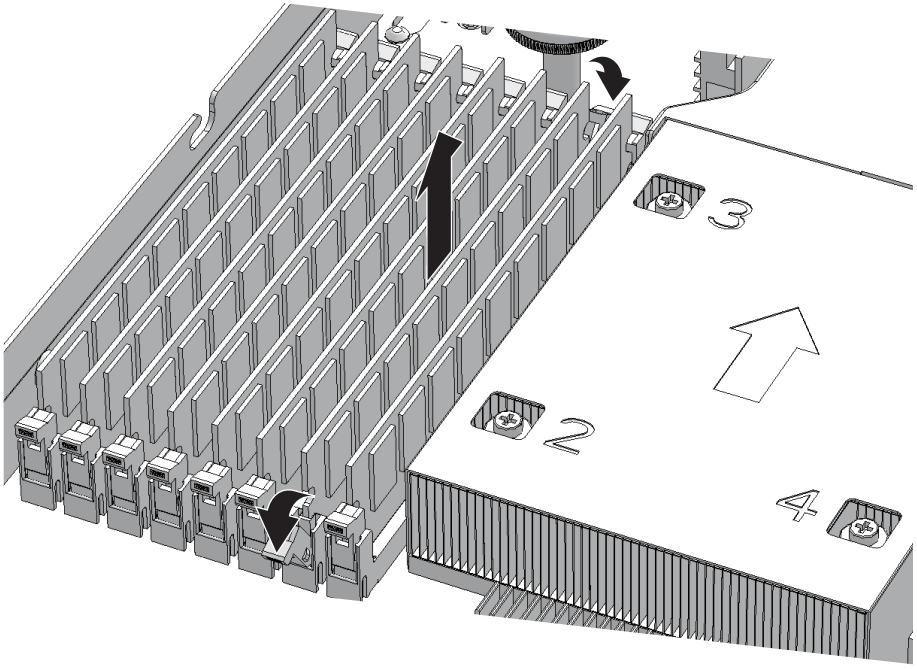
1. **Pull the chassis out of the rack.**
   For details, see "5.3.2 Pulling the chassis out from the rack."
2. **Open the fan cover.**
   For details, see "5.3.3 Opening the fan cover."
3. **Remove the upper cover.**
   For details, see "5.3.4 Removing the upper cover."
4. **Remove the air duct and the PSU backplane cover.**
   For details, see "5.3.5 Removing the air duct and PSU backplane cover."

8.5.2 Removing memory

1. **Move the latch of the memory slot outward, and then pull the memory up vertically to remove it.**

Note - Make a note of the mounting positions of the memory modules before removing them to ensure that they are reinstalled correctly.
Note - Place the removed memory on a grounded antistatic ESD mat.

Figure 8-4 Memory removal



8.6 Installing Memory

This section describes the procedure for memory installation. Perform expansion using the same procedure.

8.6.1 Installing memory

1. **Fit the notched section of the memory into the corresponding position of the connector of the memory slot.**

Note - Install the memory modules in the correct positions by referring to the notes you made before the start of maintenance.

---

2. **Push the memory module into the slot evenly.**

Note - Confirm that the latch of the memory slot has returned to the original position.

8.6.2 Restoring the chassis

1. **Install the air duct and the PSU backplane cover.**
   For details, see "6.3.2 Installing the air duct and PSU backplane cover."
2. **Install the upper cover.**
   For details, see "6.3.3 Installing the upper cover."
3. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
4. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
5. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

8.7 Restoring the System

This section describes the procedure for restoring the system after replacement, expansion, and reduction of memory.

1. **Check that the XSCF STANDBY LED on the operation panel is on.**
2. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
3. **Log in to the XSCF shell.**
4. **Execute the testsb command to confirm that the memory requiring maintenance is recognized normally.**

```
XSCF> testsb -a
```

5. **Start the system.**
   For details, see "6.2 Starting the System."
6. **Close the rack door.**

Chapter 9

Maintaining the Power Supply Units

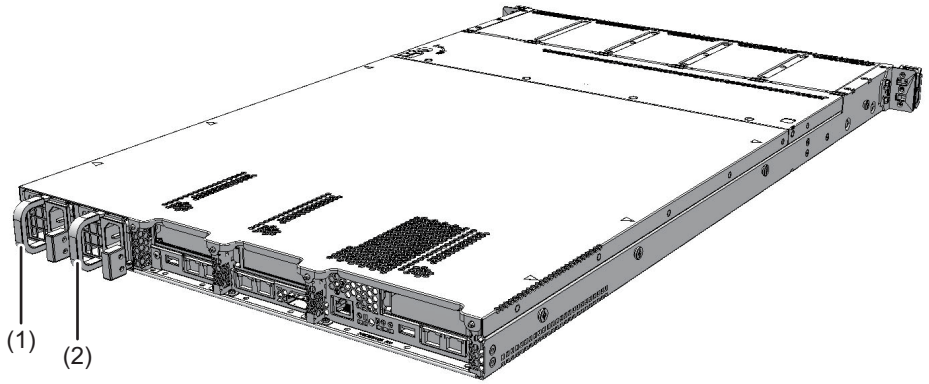
This chapter describes the maintenance procedure for the power supply units.

- Configuration of the Power Supply Units
- Before Maintaining a Power Supply Unit
- Enabling the Removal of a Power Supply Unit
- Removing a Power Supply Unit
- Installing a Power Supply Unit
- Restoring the System

9.1 Configuration of the Power Supply Units

This section describes the configuration and the locations of the power supply units. The power supply unit supplies power to the system components. The components can have the 1+1 redundant configuration. Active/hot maintenance can be performed.

Figure 9-1 Location of power supply unit



Position number	Component
1	Power supply unit (PSU#0)
2	Power supply unit (PSU#1)

9.2 Before Maintaining a Power Supply Unit

This section describes the types of and procedure for power supply unit maintenance, as well as the related precautions.

Note - Read and understand this section before starting any maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

9.2.1 Types of maintenance

Table 9-1 lists the types of maintenance for the power supply units. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 9-1 Types of maintenance for the power supply unit

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
OK	OK	OK

9.2.2 Flow of maintenance

Table 9-2 shows the maintenance procedure for the power supply units. See the relevant section.

Table 9-2 Flow of maintenance

Task		Replacement
1	Preparation	9.3
2	Removal of power supply unit	9.4
3	Installation of a power supply unit	9.5
4	System restoration	9.6

9.2.3 Precautions for replacement

Note the following points when replacing a power supply unit:

- There are two power supply units. Thus, the system can continue operating even if one of the units fails. Do not, however, operate the system for an extended period while one unit has failed.
- When replacing multiple power supply units, replace one unit at a time. If redundancy of the power supply units cannot be secured, perform maintenance with the inactive/cold (system stopped) method.
- Do not force a power supply unit into its slot. Using excessive force may damage the component or the chassis.
- The type of power supply unit varies depending on the number of CPU clocks.

9.3 Enabling the Removal of a Power Supply Unit

This section describes the preparations that must be completed prior to removing a power supply unit. The preparation procedure differs depending on the maintenance type as follows:

- Active/hot maintenance
- Inactive/hot maintenance (system stopped/hot maintenance)
- Inactive/cold maintenance (system stopped/cold maintenance)

9.3.1 Active/hot maintenance

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the power supply unit requiring maintenance.**

```
XSCF> showlogs error
```

For details, see "3.3.5 Checking log information."

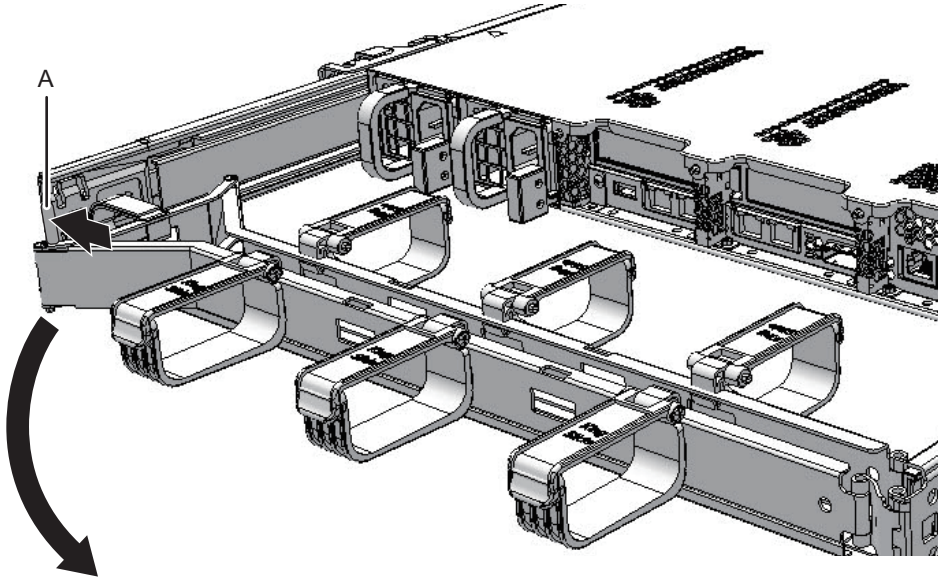
4. **Confirm the hardware and software configurations.**
For details, see "4.2 Confirming the System Configuration."
5. **Execute the replacefru command to release the power supply unit requiring maintenance from the system.**

```
XSCF> replacefru
```

For details, see "5.1 Releasing an FRU from the System with the replacefru Command."

6. **Release the cable management arm.**
Release the lock by pressing the cable management arm tab (A in the figure) toward the outside of the chassis to unlock the cable management arm.

Figure 9-2 Unlocking the cable management arm



7. **Remove the power cord from the power supply unit requiring maintenance.**
   For details, see "5.3.1 Removing the power cords."

9.3.2 Inactive/hot maintenance (system stopped/hot maintenance)

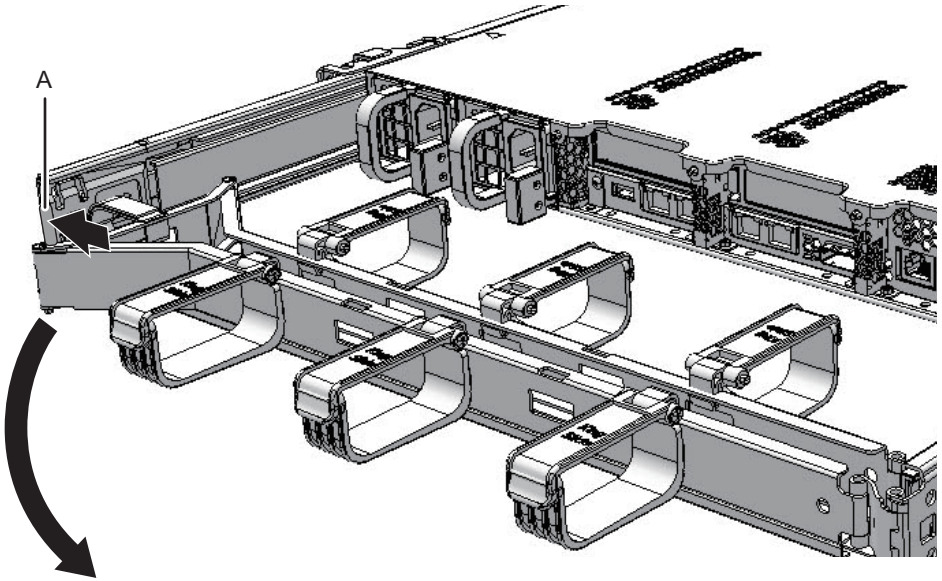
1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the power supply unit requiring maintenance.**

```
XSCF> showlogs error
```

   For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
   For details, see "5.2 Stopping the System."
6. **Release the cable management arm.**
   Release the lock by pressing the cable management arm tab (A in the figure) toward the outside of the chassis to unlock the cable management arm.

Figure 9-3 Unlocking the cable management arm



7. **Remove the power cord from the power supply unit requiring maintenance.**

For details, see "5.3.1 Removing the power cords."

9.3.3 Inactive/cold maintenance (system stopped/cold maintenance)

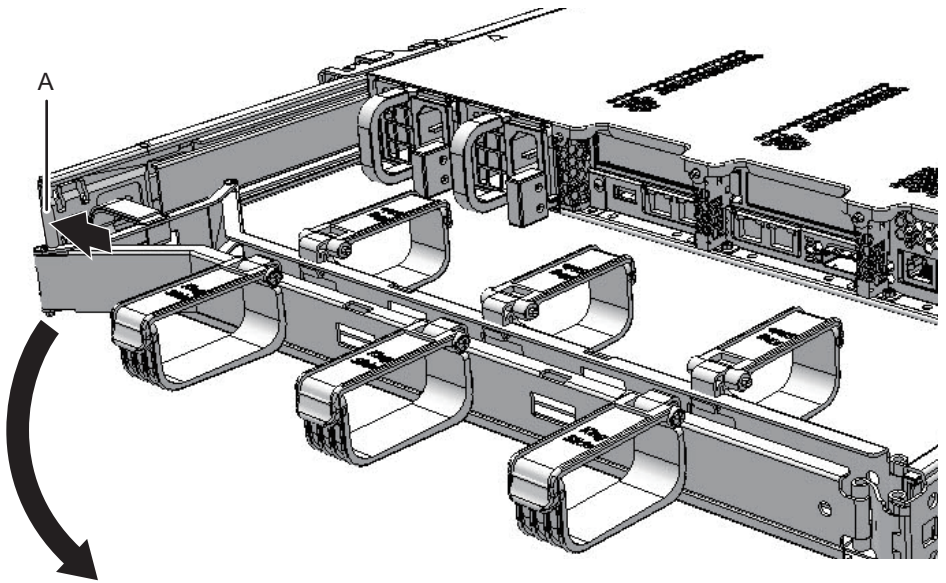
1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the power supply unit requiring maintenance.**

```
XSCF> showlogs error
```

For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
For details, see "5.2 Stopping the System."
6. **Release the cable management arm.**
Release the lock by pressing the cable management arm tab (A in the figure) toward the outside of the chassis to unlock the cable management arm.

Figure 9-4 Unlocking the cable management arm



7. **Remove all power cords from all power supply units, including the power supply unit requiring maintenance.**

For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

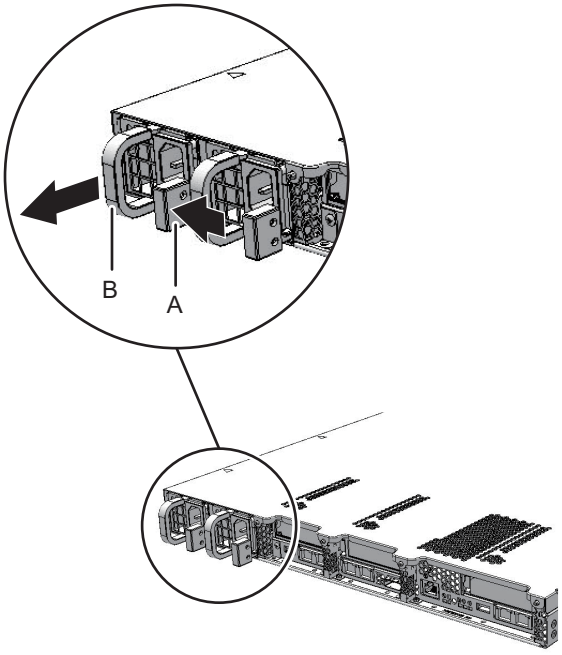
9.4 Removing a Power Supply Unit

This section describes the procedure for removing a power supply unit.
Enable removal of the power supply unit before attempting to remove it. For details, see "9.3 Enabling the Removal of a Power Supply Unit."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

1. **While pushing the lever (A in the figure) of the power supply unit requiring maintenance, grab the handle (B in the figure) to pull the power supply unit out.**

Figure 9-5 Removing a power supply unit



2. **Support the power supply unit with one hand from below and carefully pull it out of the slot.**

Note - Place the removed power supply unit on the grounded ESD mat to ground any static electricity.

9.5 Installing a Power Supply Unit

This section describes the procedure for installing a power supply unit.

1. **Support the power supply unit from below with one hand, and then carefully insert it into the slot.**

Note - Do not forcibly push the power supply unit into its slot. Using excessive force may damage the component or the chassis.

2. **Push the power supply unit firmly into the installation position.**

Note - Make sure that the power supply unit is firmly inserted and fixed.

9.6 Restoring the System

This section describes the procedures for restoring the system after installing a power supply unit. The restoration procedure differs depending on the maintenance type as follows:

- Active/hot maintenance
- Inactive/hot maintenance (system stopped/hot maintenance)
- Inactive/cold maintenance (system stopped/cold maintenance)

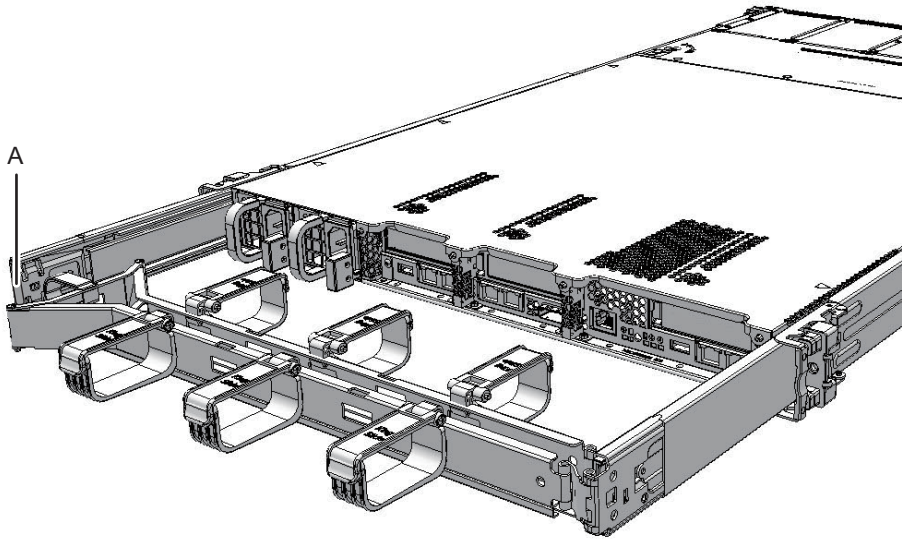
9.6.1 Active/hot maintenance

1. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
2. **Connect the power cord to the power supply unit requiring maintenance.**
   For details, see "6.3.6 Installing the power cords."
3. **Confirm that the LED (green) of the power supply unit is on.**

4. **Close the cable management arm.**

Note - Check that the cable management arm is locked with its tab (A in the figure).

Figure 9-6 Cable management arm tab



5. **Return to the operation of the XSCF firmware replacefru command to install the power supply unit in the system.**
   For details, see "6.1 Incorporating an FRU into the System with the replacefru Command."

6. **Execute the showstatus command to confirm that the power supply unit is operating normally after the maintenance.**

```
XSCF> showstatus
```

7. **Execute the showhardconf command to check the hardware configuration and the status of each component.**

```
XSCF> showhardconf
```

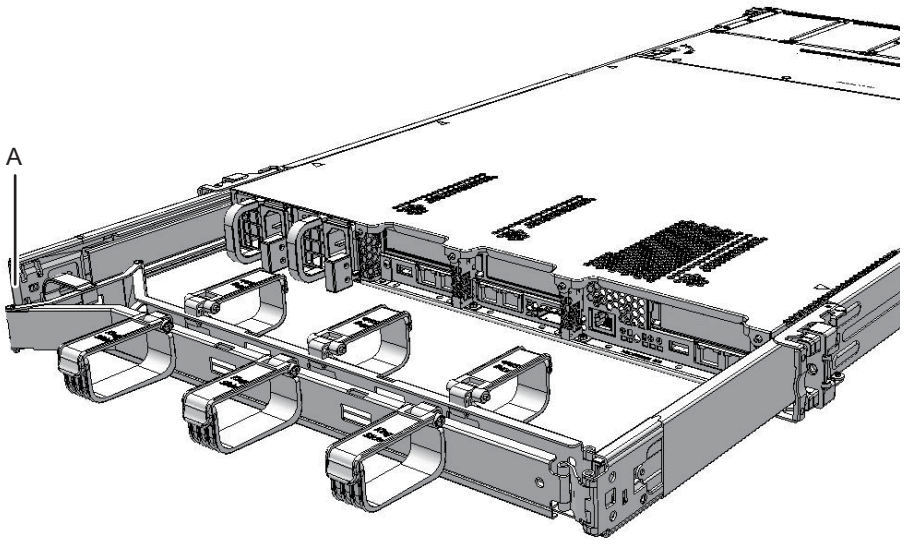
8. **Close the rack door.**

9.6.2 Inactive/hot maintenance (system stopped/hot maintenance)

1. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
2. **Connect the power cord to the power supply unit requiring maintenance.**
   For details, see "6.3.6 Installing the power cords."
3. **Confirm that the LED (green) of the power supply unit is on.**
4. **Close the cable management arm.**

Note - Check that the cable management arm is locked with its tab (A in the figure).

Figure 9-7 Cable management arm tab



5. **Check that the XSCF STANDBY LED on the operation panel is on.**
6. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
7. **Log in to the XSCF shell.**
8. **Start the system.**
   For details, see "6.2 Starting the System."
9. **Close the rack door.**

9.6.3 Inactive/cold maintenance (system stopped/cold maintenance)

1. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
2. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

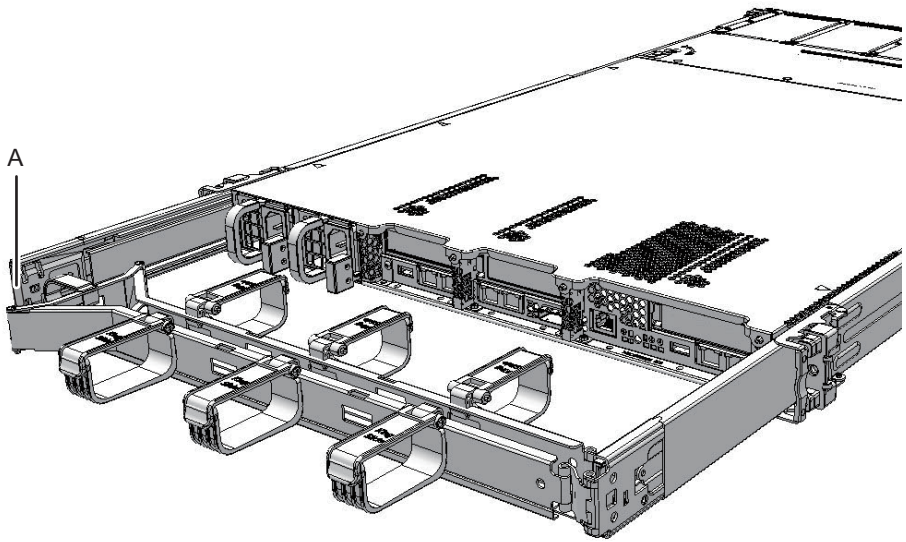
Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

---

3. **Confirm that the LED (green) of the power supply unit is on.**
4. **Close the cable management arm.**

Note - Check that the cable management arm is locked with its tab (A in the figure).

Figure 9-8 Cable management arm tab



5. **Check that the XSCF STANDBY LED on the operation panel is on.**
6. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
7. **Log in to the XSCF shell.**
8. **Start the system.**
   For details, see "6.2 Starting the System."

9. **Close the rack door.**

Chapter 10

Maintaining the Fan Units

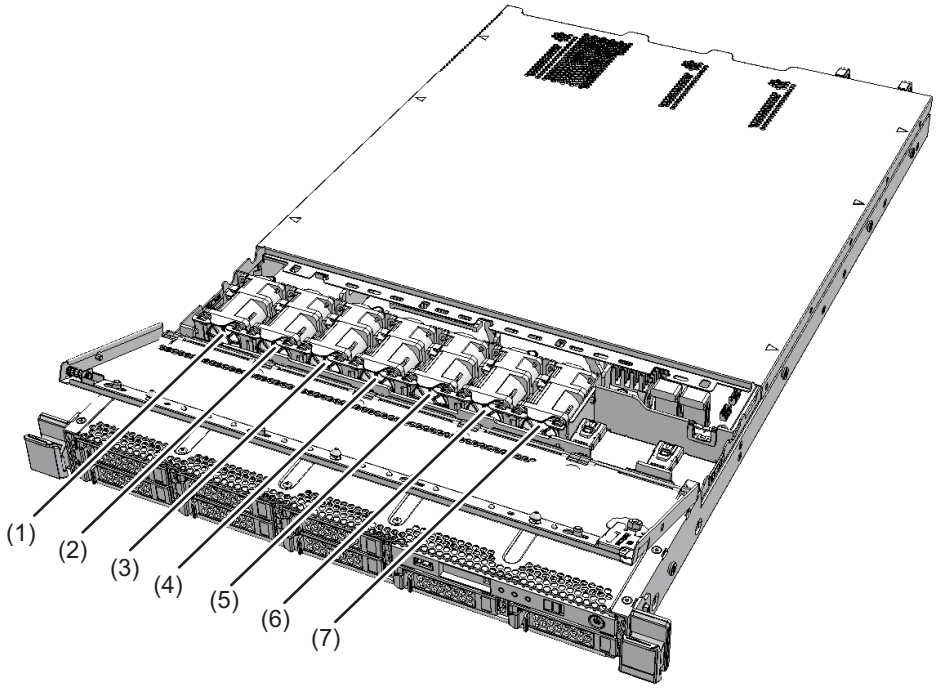
This chapter describes the maintenance procedure for the fan units.

- Configuration of the Fan Units
- Before Maintaining a Fan Unit
- Enabling the Removal of a Fan Unit
- Removing a Fan Unit
- Installing a Fan Unit
- Restoring the System

10.1 Configuration of the Fan Units

This section describes the configuration and the locations of the fan units.
Seven fan units are installed in a chassis. If an error occurs in a fan unit, XSCF detects the error. The 6 + 1 redundant configuration of the fan units allows the system to continue operating even if one fan unit fails.

Figure 10-1 Positions of Fan Units



Location number	Component
1	Fan unit (FAN#0)
2	Fan unit (FAN#1)
3	Fan unit (FAN#2)
4	Fan unit (FAN#3)
5	Fan unit (FAN#4)
6	Fan unit (FAN#5)
7	Fan unit (FAN#6)

10.2 Before Maintaining a Fan Unit

This section describes the types of and procedure for fan unit maintenance, as well as some related precautions.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

10.2.1 Types of maintenance

Table 10-1 lists the types of maintenance for the fan units. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 10-1 Types of maintenance for fan unit

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
OK	OK	OK

10.2.2 Flow of maintenance

Table 10-2 shows the maintenance procedure for the fan units. See the corresponding section and item.

Table 10-2 Flow of maintenance

Task		Replacement
1	Preparation	10.3
2	Removing a fan unit	10.4
3	Installing a fan unit	10.5
4	System restoration	10.6

10.2.3 Precautions for replacement

Note the following points when replacing a fan unit:

- When you replace multiple fan units, do so one by one. If redundancy of the fan units cannot be secured, perform maintenance using the inactive/cold (system stopped) method.
- The fan units have a redundant configuration. Thus, the system can continue operating even if one of the fan units fails. Do not, however, operate the system for an extended period with one failed unit. Replace any failed fan unit immediately.

10.3 Enabling the Removal of a Fan Unit

This section describes the preparation that must be completed prior to removing a fan unit. The preparation procedure differs depending on the maintenance type as follows:

- Active/hot maintenance
- Inactive/hot maintenance (system stopped/hot maintenance)
- Inactive/cold maintenance (system stopped/cold maintenance)

10.3.1 Active/hot maintenance

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the fan unit requiring maintenance.**

```
XSCF> showlogs error
```

For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Execute the replacefru command to disconnect the fan unit requiring maintenance from the system.**

```
XSCF> replacefru
```

For details, see "5.1 Releasing an FRU from the System with the replacefru Command."

10.3.2 Inactive/hot maintenance (system stopped/hot maintenance)

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the fan unit requiring maintenance.**

```
XSCF> showlogs error
```

For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
   For details, see "5.2 Stopping the System."

10.3.3 Inactive/cold maintenance (system stopped/cold maintenance)

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the fan unit requiring maintenance.**

```
XSCF> showlogs error
```

   For details, see "3.3.5 Checking log information."
4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
   For details, see "5.2 Stopping the System."
6. **Remove all the power cords from the power supply unit.**
   For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

10.4 Removing a Fan Unit

This section describes the procedure for removing a fan unit.
Enable the removal of a fan unit before attempting to remove it. For details, see "10.3 Enabling the Removal of a Fan Unit."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

10.4.1 Accessing a fan unit

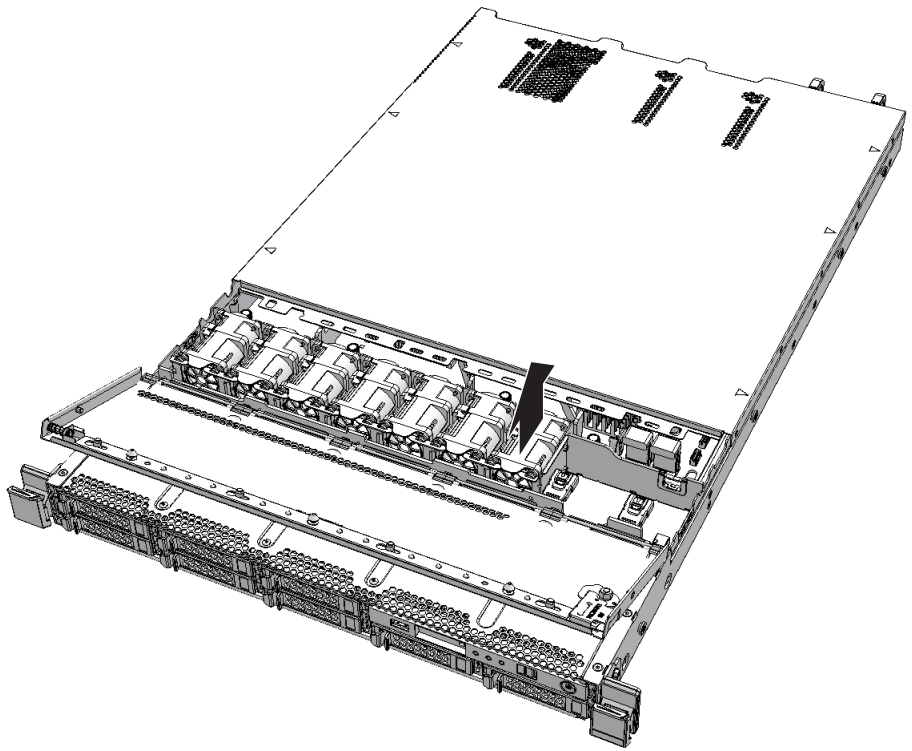
1. **Pull the chassis out of the rack.**
   For details, see "5.3.2 Pulling the chassis out from the rack."
2. **Open the fan cover.**
   For details, see "5.3.3 Opening the fan cover."

10.4.2 Removing a fan unit

1. **Pinch the front and rear faces of the fan unit to be replaced, and pull it up to remove it.**

Note - Place the removed fan unit on a grounded antistatic ESD mat.

Figure 10-2 Removal of fan unit



10.5 Installing a Fan Unit

This section describes the procedure for installing a fan unit.

10.5.1 Installing a fan unit

1. **Install a fan unit into its slot vertically.**

Note - Do not force a fan unit into its slot. Using excessive force may damage the component or the chassis.

---

2. **Push the fan unit in firmly while aligning the connector on the back of the fan unit with the connector on the motherboard unit.**

Note - Check that the fan unit is firmly inserted and secured.

10.6 Restoring the System

This section describes the procedure for restoring the system after installing a fan unit. The restoration procedure differs depending on the maintenance type as follows:

- Active/hot maintenance
- Inactive/hot maintenance (system stopped/hot maintenance)
- Inactive/cold maintenance (system stopped/cold maintenance)

10.6.1 Active/hot maintenance

1. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
2. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
3. **Return to the operation of the XSCF firmware replacefru command to install the fan unit in the system.**
   For details, see "6.1 Incorporating an FRU into the System with the replacefru Command."
4. **Execute the showstatus command to confirm that the fan unit is operating normally after maintenance.**

```
XSCF> showstatus
```

5. **Execute the showhardconf command to check the hardware configuration and the status of each component.**

```
XSCF> showhardconf
```

6. **Close the rack door.**

10.6.2 Inactive/hot maintenance (system stopped/hot maintenance)

1. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
2. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
3. **Check that the XSCF STANDBY LED on the operation panel is on.**
4. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
5. **Log in to the XSCF shell.**
6. **Start the system.**
   For details, see "6.2 Starting the System."
7. **Close the rack door.**

10.6.3 Inactive/cold maintenance (system stopped/cold maintenance)

1. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
2. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
3. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

---

4. **Check that the XSCF STANDBY LED on the operation panel is on.**
5. **Switch the mode switch on the operation panel to Locked mode.**

For details, see "2.2.2 Control function of the operation panel."

6. **Log in to the XSCF shell.**
7. **Start the system.**
   For details, see "6.2 Starting the System."
8. **Close the rack door.**

Chapter 11

Maintaining the Internal Disks

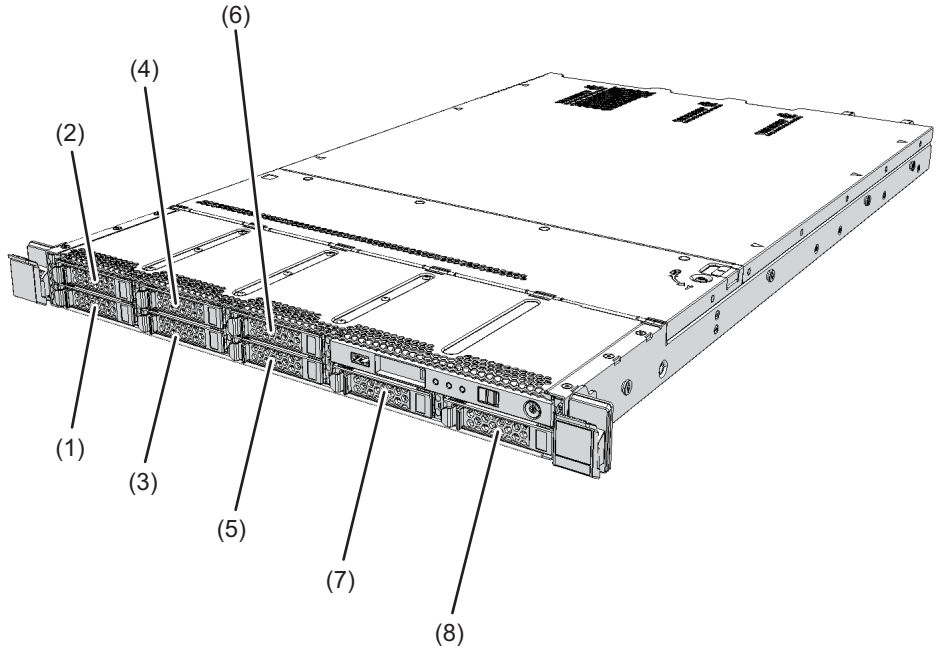
This chapter describes the maintenance procedure for an internal disk. An internal disk can be replaced, expanded, or reduced.

- Configuration of the Internal Disks
- Before Maintaining an Internal Disk
- Enabling the Removal of an Internal Disk
- Removing an Internal Disk
- Installing an Internal Disk
- Restoring the System

11.1 Configuration of the Internal Disks

This section describes the configuration and locations of the internal disks.
The chassis has eight (8) slots for mounting internal disks. The system memory storage can be expanded by installing extra hard disk drives (HDDs) or solid state drives (SSDs) in these slots.

Figure 11-1 Location of internal disks



Location number	Component
1	Internal disk (HDD#0)
2	Internal disk (HDD#1)
3	Internal disk (HDD#2)
4	Internal disk (HDD#3)
5	Internal disk (HDD#4)
6	Internal disk (HDD#5)
7	Internal disk (HDD#6)
8	Internal disk (HDD#7)

11.1.1 Disk slot number

To perform active replacement of an internal disk drive, you need to know the physical device name or logical device name of a drive to be installed or removed. If a disk error occurs in the system, from the system console, you can normally check for messages regarding a disk that is likely to fail or that has already failed. This information is also recorded in the /var/adm/messages file.

In these error messages, a failed internal disk drive is normally indicated with the

physical device name or logical device name. In addition, depending on the application, the slot number of the disk may be reported.

Procedure to confirm the mounting position information on the HDD varies depending on the operating system.

- **For Oracle Solaris 11**
  For details, see "Use the format command (Oracle Solaris 11)" or "Use the diskinfo command (Oracle Solaris 11)."
- **For Oracle Solaris 10**
  For details, see "Use the diskinfo command (Oracle Solaris 10)."

Use the format command (Oracle Solaris 11)

1. **Execute the format command to confirm the disk slot.**
   (1) to (4) in the following example represent:

   (1): Logical path name of the disk

   (2): The disk is mounted in the HDD00 slot

   (3): The disk is mounted in the HDD01 slot

   (4): The disk is mounted in the HDD02 slot

```
# format
Searching for disks...done
AVAILABLE DISK SELECTIONS:
       0. c2t50000393B81B3A36d0 <TOSHIBA-MBF2600RC-3706 cyl 46873 alt 2 hd 20
sec 625> <-- (1)
          /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000393b81b3a36,0
          /dev/chassis/SYS/HDD00/disk <-- (2)
       1. c2t500000E01FB332A2d0 <FUJITSU-MBD2600RC-3701 cyl 46873 alt 2 hd 20
sec 625> <-- (1)
          /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w500000e01fb332a2,0
          /dev/chassis/SYS/HDD01/disk <-- (3)
       2. c2t50000393B81B4D7Ad0 <TOSHIBA-MBF2600RC-3706 cyl 46873 alt 2 hd 20
sec 625> <-- (1)
          /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000393b81b4d7a,0
          /dev/chassis/SYS/HDD02/disk <-- (4)
Specify disk (enter its number):
```

Use the diskinfo command (Oracle Solaris 11)

1. **Execute the diskinfo command to confirm the disk slot.**
   (1) to (3) in the following example represent:

   (1): The device path name and logical path name of the disk mounted in HDD 0

   (2): The device path name and logical path name of the disk mounted in HDD 1

   (3): The device path name and logical path name of the disk mounted in HDD 2

```
# diskinfo
D:devchassis-path                          c:occupant-compdev
-----------------------------------------  ---------------------
```

```
/dev/chassis//SYS/MBU/HDD0                  -
/dev/chassis//SYS/MBU/HDD1                  -
/dev/chassis//SYS/MBU/HDD2                  -
/dev/chassis//SYS/MBU/HDD3                  -
/dev/chassis//SYS/MBU/HDD4                  -
/dev/chassis//SYS/MBU/HDD5                  -
/dev/chassis//SYS/MBU/HDD6                  -
/dev/chassis//SYS/MBU/HDD7                  -
/dev/chassis/SYS/HDD00/disk                 c0t50000393B81B3A36d0 <-- (1)
/dev/chassis/SYS/HDD01/disk                 c0t500000E01FB332A2d0 <-- (2)
/dev/chassis/SYS/HDD02/disk                 c0t50000393B81B4D7Ad0 <-- (3)
/dev/chassis/SYS/HDD03/disk
/dev/chassis/SYS/HDD04/disk
/dev/chassis/SYS/HDD05/disk
/dev/chassis/SYS/HDD06/disk
/dev/chassis/SYS/HDD07/disk
#
```

Use the diskinfo command (Oracle Solaris 10)

1. **Execute the diskinfo command to confirm the disk slot.**
   (1) to (3) in the following example represent:

   (1): The device path name and logical path name of the disk mounted in HDD 0

   (2): The device path name and logical path name of the disk mounted in HDD 1

   (3): The device path name and logical path name of the disk mounted in HDD 2

```
# diskinfo -ap

Enclosure path:         TZ01232002-physical-hba-0
Chassis Serial Number:  TZ01232002-physical-hba-0
Chassis Model:          ORCL,SPARC64-X

Enclosure path:         /dev/es/ses0
Chassis Serial Number:  500000e0e04901bf
Chassis Model:          FUJITSU-NBBEXP

Label      Disk name               Vendor   Product          Vers
---------- ----------------------  -------- ---------------- ----
HDD_0      c0t50000393B81B3A36d0   TOSHIBA  MBF2600RC        3706 <-- (1)
        Physical path
        --------------------------------
        0: /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000393b81b3a36,0
HDD_1      c0t500000E01FB332A2d0   TOSHIBA  MBF2600RC        3706 <-- (2)
        Physical path
        --------------------------------
        0: /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w500000e01fb332a2,0
HDD_2      c0t50000393B81B4D7Ad0   TOSHIBA  MBF2600RC        3706 <-- (3)
        Physical path
        --------------------------------
        0: /pci@8000/pci@4/pci@0/pci@0/scsi@0/iport@f/disk@w50000393b81b4d7a,0
```

11.2 Before Maintaining an Internal Disk

This section describes the types and flow of internal disk maintenance, as well as the related precautions.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

11.2.1 Types of maintenance

Table 11-1 lists the types of maintenance for the internal disks. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 11-1 Types of maintenance for internal disk

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
OK (*)	OK	OK

*: Active/hot maintenance can be performed for an internal disk of any device other than the boot device. When the boot device has a redundant configuration (with a RAID configuration), however, active/hot maintenance can also be performed for the internal disk of the boot device.

11.2.2 Flow of maintenance

Table 11-2 shows the maintenance procedure for the internal disks. See the relevant section.
The procedure for expanding an internal disk is the same as that for installation. The procedure for reducing an internal disk is the same as that for removal.

Table 11-2 Flow of maintenance

Task		Replacement	Expansion	Reduction
1	Preparation	11.3	11.3	11.3
2	Removing an internal disk	11.4	-	11.4
3	Installing an internal disk	11.5	11.5	-
4	System restoration	11.6	11.6	11.6

11.2.3 Precautions for expansion

Note the following points when you expand an internal disk.

- When you expand an internal disk, remove the filler unit from the slot into which you intend to install the internal disk.
- Keep the removed internal disk filler unit because it will be needed if an internal disk is subsequently reduced.

11.2.4 Precautions for reduction

Note the following points when you reduce an internal disk.

- When you reduce an internal disk, install the filler unit into the slot from which the internal disk has been removed.

11.3 Enabling the Removal of an Internal Disk

This section describes the preparations that must be completed prior to removing an internal disk. The preparation procedure differs depending on the maintenance type as follows:

- Active/hot maintenance
- Inactive/hot maintenance (system stopped/hot maintenance)
- Inactive/cold maintenance (system stopped/cold maintenance)

11.3.1 Active/hot maintenance

Note - Unless the system has a redundant configuration, the data on the internal disk will be lost. Thus, perform this operation only after backing up the data in advance. In addition, active/hot maintenance of the boot device in a non-redundant configuration cannot be performed.

Before performing maintenance, check the hardware configuration and software configuration. For details, see "4.2 Confirming the System Configuration."
The procedure may vary depending on the configuration of the internal disk.

When the system is configured with a hardware RAID

Perform the operation only after determining which internal disk has failed. For

details, see "14.2.9 Checking for a failed disk drive" and "14.2.10 Replacing a failed disk drive" in *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.

When the system is configured with a software RAID

See your software manual.

When the system is configured without either a hardware RAID or software RAID

To expand an internal disk, perform the procedure up to step 3.

1. **Open the rack door.**
2. **Display the Oracle Solaris super-user prompt.**
3. **Execute the cfgadm(1M) command to check the configuration of the internal disk.**
   If you replace or reduce an internal disk, use the cfgadm -a command to check the Ap_ID of the disk requiring maintenance and make a note of it. The Ap_ID refers to a string such as "c4::dsk/c4t5000039428298FFEd0".

   If you expand an internal disk, use the cfgadm -a command to check the number of disks mounted.

```
# cfgadm -a
```

4. **Stop all applications from using the internal disk.**
5. **Execute the cfgadm(1M) command to release the internal disk requiring maintenance from the system.**
   Enter the Ap_ID you noted in advance.

```
# cfgadm -c unconfigure Ap_ID
```

6. **Execute the cfgadm(1M) command to identify the location of the internal disk requiring maintenance by causing the CHECK LED on the internal disk to blink.**
   Enter the Ap_ID you noted in advance.

```
# cfgadm -x led=fault,mode=blink Ap_ID
```

7. **Execute the cfgadm(1M) command to confirm that the internal disk requiring maintenance is disconnected.**
   The disconnected internal disk is displayed as "unconfigured."

```
# cfgadm -a
```

11.3.2 Inactive/hot maintenance (system stopped/hot maintenance)

1. **Open the rack door.**
2. **Display the Oracle Solaris super-user prompt.**
3. **Stop the system.**
   For details, see "5.2 Stopping the System."

11.3.3 Inactive/cold maintenance (system stopped/cold maintenance)

1. **Open the rack door.**
2. **Display the Oracle Solaris super-user prompt.**
3. **Stop the system.**
   For details, see "5.2 Stopping the System."
4. **Remove all the power cords from the power supply unit.**
   For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

11.4 Removing an Internal Disk

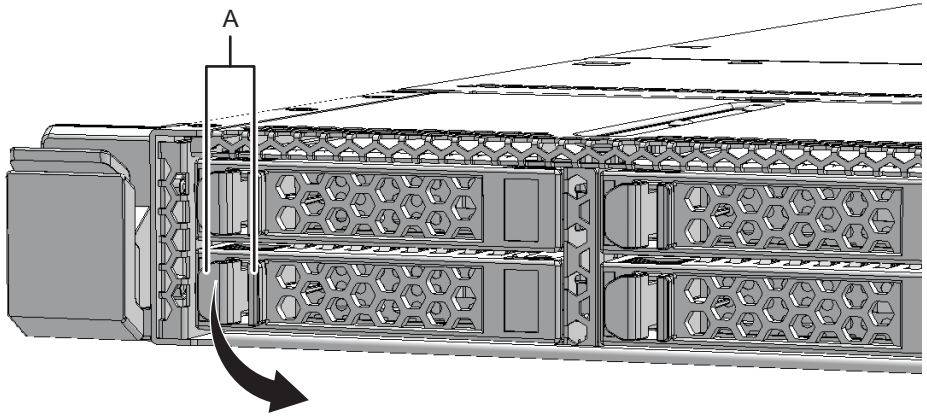
This section describes the procedures for removing internal disks. Perform reduction using the same procedure.
Make the internal disk ready for removal before attempting to remove it. For details, see "11.3 Enabling the Removal of an Internal Disk."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

---

1. **Push the knob (A in the figure) of the internal disk to release the lock and open the lever.**

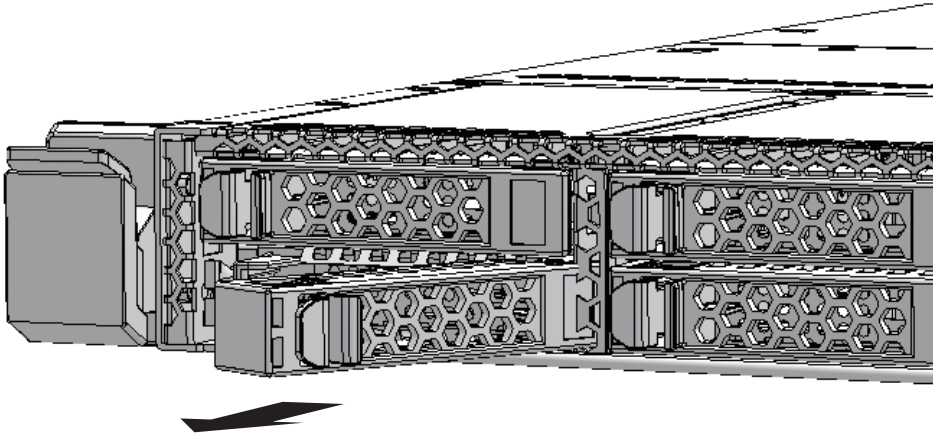
Figure 11-2 Knob of internal disk



2. **Hold the lever and pull the internal disk about 2 to 3 cm (0.8 to 1.2 in.) forwards.**

Note - When performing active/hot maintenance, hold this position until the motor rotation stops (about 1 minute).

Figure 11-3 Removing an internal disk



3. **Carefully remove an internal disk from its slot.**

Note - Place the removed internal disk on the grounded antistatic ESD mat.
Note - When you reduce an internal disk, install the filler unit into the slot from which you removed the internal disk.

11.5 Installing an Internal Disk

This section describes the procedure for installing an internal disk. Perform expansion using the same procedure.

Caution - Do not attempt to insert an internal disk into a slot when the lever is closed. Otherwise, the internal disk could jam and prove difficult to remove.

Note - When expanding an internal disk, remove the filler unit of the internal disk from the slot into which you will install the internal disk.

1. **Open the lever and hold the internal disk.**
2. **Carefully insert the internal disk into the slot.**

Note - Do not force the internal disk into the slot. Using excessive force may damage the component or the chassis.

3. **Close the lever to secure the internal disk.**

11.6 Restoring the System

This section describes the procedures for restoring the system after replacement, expansion, and reduction of internal disks. The restoration procedure differs depending on the maintenance type as follows:

- Active/hot maintenance
- Inactive/hot maintenance (system stopped/hot maintenance)
- Inactive/cold maintenance (system stopped/cold maintenance)

11.6.1 Active/hot maintenance

The procedure may vary depending on the configuration of the internal disk.

When the system is configured with a hardware RAID

The operation varies depending on the hardware RAID configuration (RAID 0, RAID 1, or RAID 1E). For details, see "14.2.10 Replacing a failed disk drive" in the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*.

When the system is configured with a software RAID

See your software manual.

When the system is configured without either a hardware RAID or software RAID

If you replaced or reduced an internal disk, perform the procedure from step 2.

1. **Return to the operation of the cfgadm(1M) command of Oracle Solaris super-user prompt and confirm that the number of internal disks has increased.**
   If you expanded an internal disk, make note of the AP_ID of the added disk. An example of the Ap_ID is c4::dsk/c4t5000039428298FFEd0.

   If you replaced or reduced an internal disk, you do not have to perform this step.

```
# cfgadm -a
```

2. **Return to the operation of the cfgadm(1M) command of Oracle Solaris super-user prompt and incorporate the internal disk requiring maintenance into Oracle Solaris.**
   Enter the Ap_ID you noted in advance.

```
# cfgadm -c configure Ap_ID
```

3. **Execute the cfgadm(1M) command to confirm that the internal disk requiring maintenance has been incorporated.**
   The incorporated internal disk is displayed as "configured."

```
# cfgadm -a
```

4. **Close the rack door.**

11.6.2 Inactive/hot maintenance (system stopped/hot maintenance)

1. **Check that the XSCF STANDBY LED on the operation panel is on.**
2. **Log in to the XSCF shell.**
3. **Execute the testsb command to confirm that the internal disk requiring maintenance is recognized.**
   When you enter the "-y" option for the testsb command, the system automatically answers "y" (yes) in response to an inquiry.

   The following example shows the diagnosis of system board "00-0".

```
XSCF> testsb -y -p 00-0
```

During the diagnosis processing, the probe-scsi-all command of the OpenBoot PROM is executed, and the result is displayed.

4. **Start the system.**
   For details, see "6.2 Starting the System."
5. **Close the rack door.**

11.6.3 Inactive/cold maintenance (system stopped/cold maintenance)

1. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

---

2. **Check that the XSCF STANDBY LED on the operation panel is on.**
3. **Log in to the XSCF shell.**
4. **Execute the testsb command to confirm that the internal disk requiring maintenance is recognized.**
   When you enter the "-y" option for the testsb command, the system automatically answers "y" (yes) in response to an inquiry.

   The following example shows the diagnosis of system board "00-0".

```
XSCF> testsb -y -p 00-0
```

   During the diagnosis processing, the probe-scsi-all command of the OpenBoot PROM is executed, and the result is displayed.

5. **Start the system.**
   For details, see "6.2 Starting the System."
6. **Close the rack door.**

Chapter 12

Maintaining the PCI Express Cards

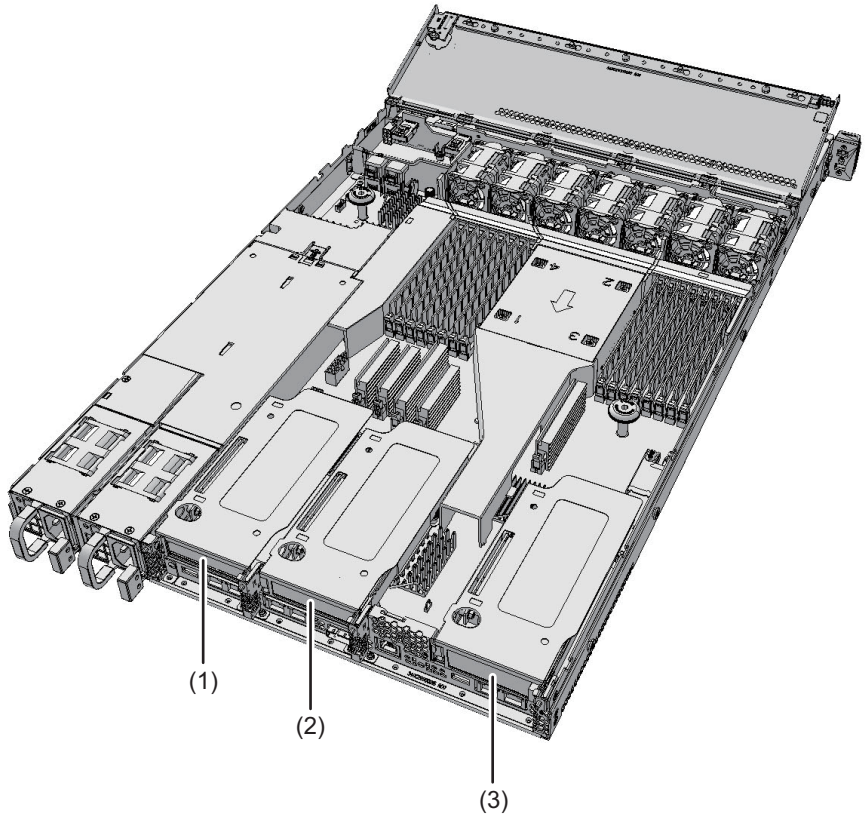
This chapter describes the maintenance procedure for a PCI Express (PCIe) card. A PCIe card can be replaced, expanded, and reduced.

- Configuration of the PCIe Cards
- Before Maintaining a PCIe Card
- Enabling the Removal of a PCI Express Card
- Removing a PCI Express Card
- Installing a PCI Express Card
- Restoring the System

12.1 Configuration of the PCIe Cards

This section describes the configuration and location of the PCIe cards. Up to three (3) PCIe cards can be mounted.

Figure 12-1 Location of the PCIe card



Location number	Component
1	PCIe card (PCI#0)
2	PCIe card (PCI#1)
3	PCIe card (PCI#2)

12.2 Before Maintaining a PCIe Card

This section describes the types of maintenance for PCIe cards, the maintenance flow, and related precautions.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

12.2.1 Types of maintenance

Table 12-1 lists the types of maintenance for the PCIe cards. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 12-1 Types of maintenance for PCIe cards

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
-	-	OK

12.2.2 Flow of maintenance

Table 12-2 lists the sequence of the maintenance procedure for PCIe cards. See the corresponding section and item.
The procedure for PCIe card expansion is the same as that for installation. The procedure for PCIe card reduction is the same as that for removal.

Table 12-2 Flow of maintenance

Task		Replacement	Expansion	Reduction
1	Preparation	12.3	12.3	12.3
2	Removal of PCIe card or PCIe card filler	12.4	12.4	12.4
3	Installation of PCIe card or PCIe card filler	12.5	12.5	12.5
4	System restoration	12.6	12.6	12.6

12.2.3 Precautions for replacement

Note the following points when replacing PCIe cards.

- When replacing the PCIe card, stop the system and remove the PCIe riser from the motherboard unit.

12.2.4 Precautions for expansion

Note the following points when performing PCIe card expansion.

- If you are expanding a PCIe card, remove the PCIe card filler from the PCIe riser. The PCIe card filler is easily removed. Be careful not to drop it.
- Keep the removed PCIe card filler because it will be needed if a PCIe card is subsequently reduced.

12.2.5 Precautions for reduction

Note the following points when reducing a PCIe card.

- When reducing a PCIe card, remove PCIe card from the PCIe riser and then install the PCIe card filler. Mount it on the motherboard unit. The PCIe card filler is easily removed. Be careful not to drop it.

12.3 Enabling the Removal of a PCI Express Card

This section describes the preparations that must be completed prior to the removal of a PCIe card.

Caution - To completely shut down the system, all the power cords must be removed. If the power cords are not removed, an electrical failure may occur.

1. **Open the rack door.**
2. **Log in to the XSCF.**
3. **Execute the showlogs command to identify the PCIe card requiring maintenance.**

```
XSCF> showlogs error
```

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
   For details, see "5.2 Stopping the System."
6. **Remove all the power cords from the power supply unit.**
   For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

12.4 Removing a PCI Express Card

This section describes the procedure for removing a PCIe card. Perform reduction using the same procedure.
To expand a PCIe card, remove the PCIe card filler instead of the PCIe card.
Enable removal of the PCIe card before attempting to remove it. For details, see "12.3 Enabling the Removal of a PCI Express Card."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

12.4.1 Accessing a PCIe card

1. **Disconnect all the cables connected to the PCIe card requiring maintenance.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

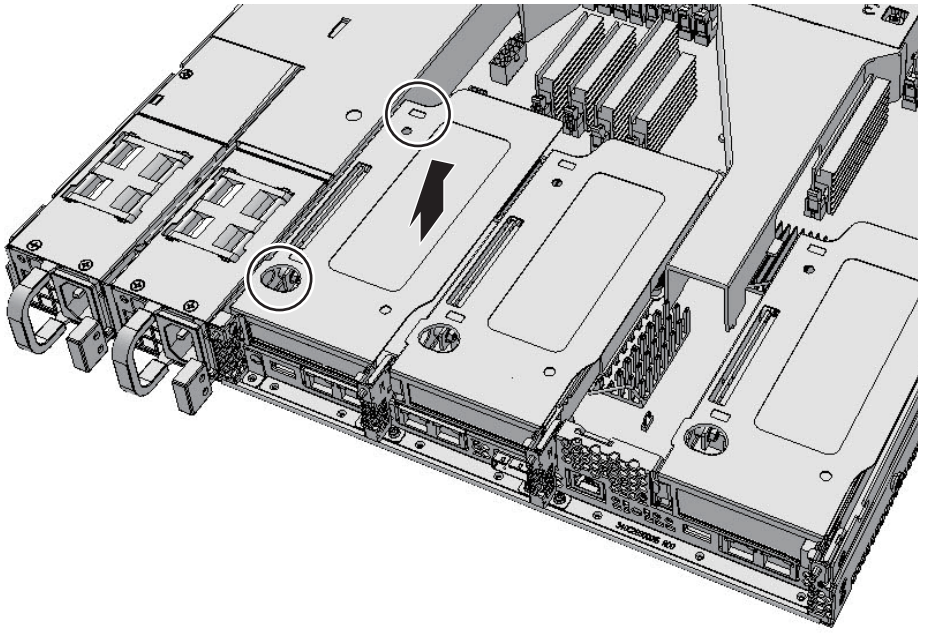
2. **Pull the chassis out of the rack.**
   For details, see "5.3.2 Pulling the chassis out from the rack."
3. **Open the fan cover.**
   For details, see "5.3.3 Opening the fan cover."
4. **Remove the upper cover.**
   For details, see "5.3.4 Removing the upper cover."

12.4.2 Removing a PCI Express riser

1. **Hold the PCIe riser at two points and remove it.**

Note - Place the removed PCIe riser on the grounded antistatic ESD mat.

Figure 12-2 Removing the PCIe riser

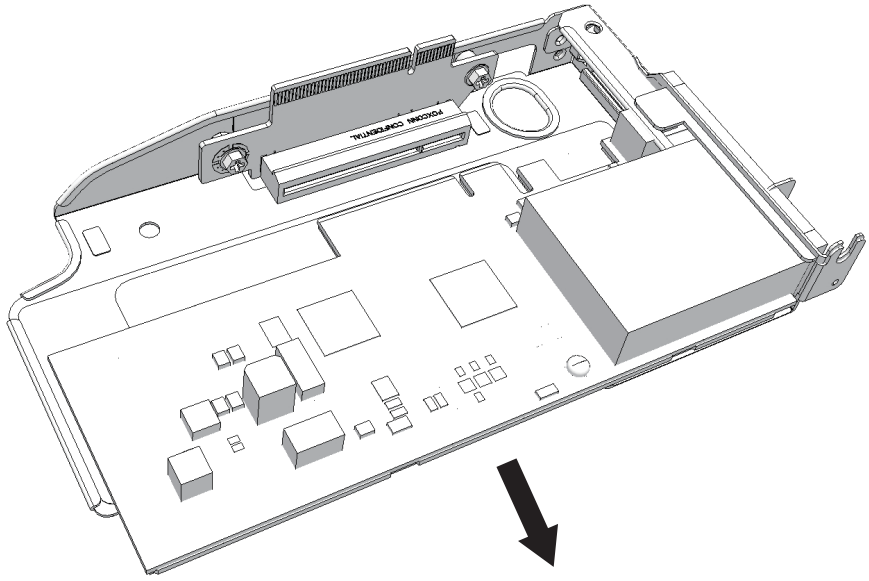


12.4.3 Removing a PCIe card

1. **Remove the PCIe card from the PCIe riser connector.**
   When you expand a PCIe card, you do not have to perform this step. Remove the PCIe card filler from the PCIe riser.

Note - Do not forcibly remove a PCIe card from a PCIe riser. The use of excessive force may damage the PCIe card.
Note - Place the removed PCIe card on the grounded antistatic ESD mat.
Note - The PCIe card filler is easily removed. Be careful not to drop it.

Figure 12-3 Removing a PCIe card



12.5 Installing a PCI Express Card

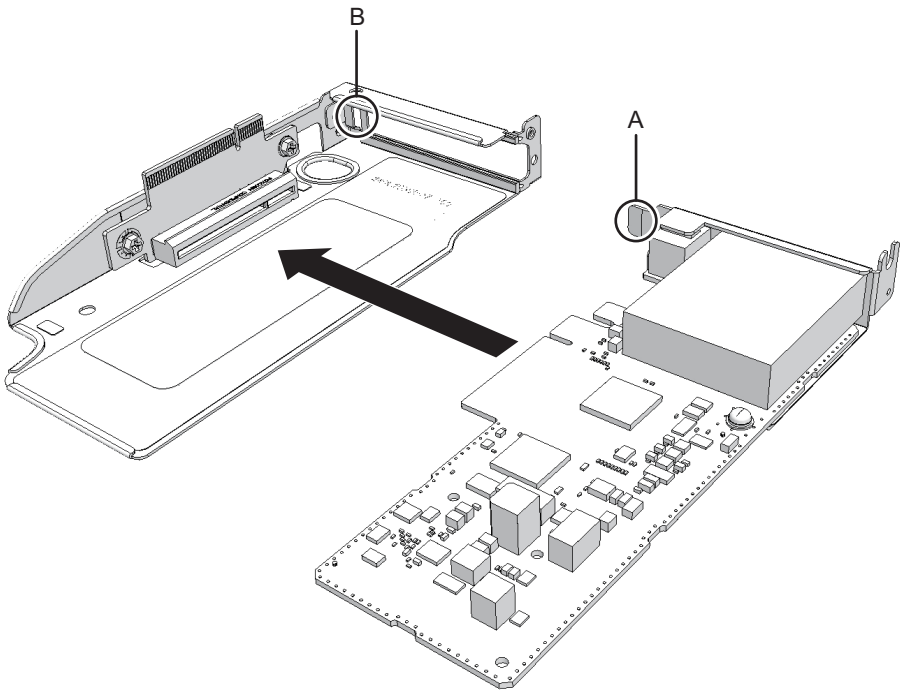
This section describes the procedure for installing a PCIe card. Perform expansion using the same procedure. When reducing a PCIe card, install the PCIe card filler instead of PCIe card.

12.5.1 Installing a PCI Express card

1. **Insert the PCIe card into the connector of the PCIe riser.**
   When you reduce a PCIe card, you do not have to perform this step. Install the PCIe card filler in the PCIe riser.

Note - Confirm that the tab (A in the figure) of the PCIe card or the tab of the PCIe card filler is inserted in the notch (B in the figure) of the PCIe riser.
Note - The PCIe card filler is easily removed. Be careful not to drop it.

Figure 12-4 Installing a PCIe card



12.5.2 Installing a PCIe riser

1. **Hold the PCIe riser at two points and install it on the motherboard unit.**

12.5.3 Restoring the chassis

1. **Install the upper cover.**
   For details, see "6.3.3 Installing the upper cover."
2. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
3. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
4. **Connect all the cables to the PCIe card.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.

12.6 Restoring the System

This section describes the procedures for restoring the system after replacement, expansion, and reduction of PCIe cards.

1. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
2. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

---

3. **Check that the XSCF STANDBY LED on the operation panel is on.**
4. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
5. **Log in to the XSCF shell.**
6. **Execute the testsb command to confirm that the PCIe card requiring maintenance is recognized.**
   When you enter the "-y" option for the testsb command, the system automatically answers "y" (yes) in response to an inquiry.

   The following example shows the diagnosis of system board "00-0".

```
XSCF> testsb -y -s 00-0
```

   During the diagnosis processing, the show-devs command of OpenBoot PROM is executed, and the result is displayed.

7. **Start the system.**
   For details, see "6.2 Starting the System."
8. **Close the rack door.**

Chapter 13

Maintaining the PSU Backplane

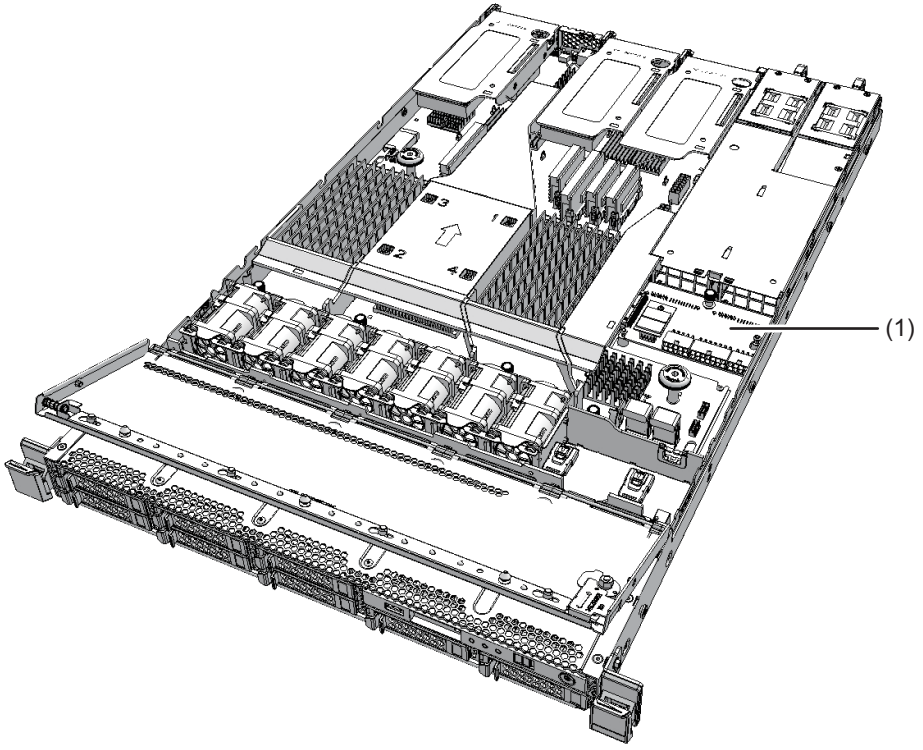
This chapter describes the maintenance procedure for the PSU backplane.

- Position of the PSU Backplane
- Before Maintaining the PSU Backplane
- Enabling the Removal of the PSU Backplane
- Removing the PSU Backplane
- Installing the PSU Backplane
- Restoring the System

13.1 Position of the PSU Backplane

This section describes the position of the PSU backplane.
The PSU backplane has connectors to enable the connection of multiple power supply units.

Figure 13-1 Position of the PSU backplane



Location number	Component
1	PSU backplane (PSUBP)

13.2 Before Maintaining the PSU Backplane

This section describes the types and the procedure for maintaining the PSU backplane, as well as some related precautions.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

13.2.1 Types of maintenance

Table 13-1 lists the types of maintenance for the PSU backplane. For the definition of

maintenance, see "4.3 Understanding Types of Maintenance."

Table 13-1 Maintenance types of PSU backplane

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
-	-	OK

13.2.2 Precautions for replacement

Note the following points when you replace the PSU backplane:

- If you replace the motherboard unit and the PSU backplane at the same time, the system may fail to operate correctly. Replace the motherboard unit or the PSU backplane, and then execute the showhardconf or showstatus command to verify that the replaced Field Replaceable Unit (FRU) is fully operational. Then, replace the other FRU.

13.3 Enabling the Removal of the PSU Backplane

This section describes the preparations that must be completed prior to the removal of the PSU backplane.

Caution - To completely shut down the system, all the power cords must be removed. If the power cords are not removed, an electrical failure may occur.

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the maintenance-target PSU backplane.**

```
XSCF> showlogs error
```

   For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
   For details, see "5.2 Stopping the System."
6. **Remove all the power cords from the power supply unit.**

For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

13.4 Removing the PSU Backplane

This section describes the procedure for removing the PSU backplane.
Enable the removal of the PSU backplane before attempting to remove it. For details, see "13.3 Enabling the Removal of the PSU Backplane."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

13.4.1 Accessing the PSU backplane

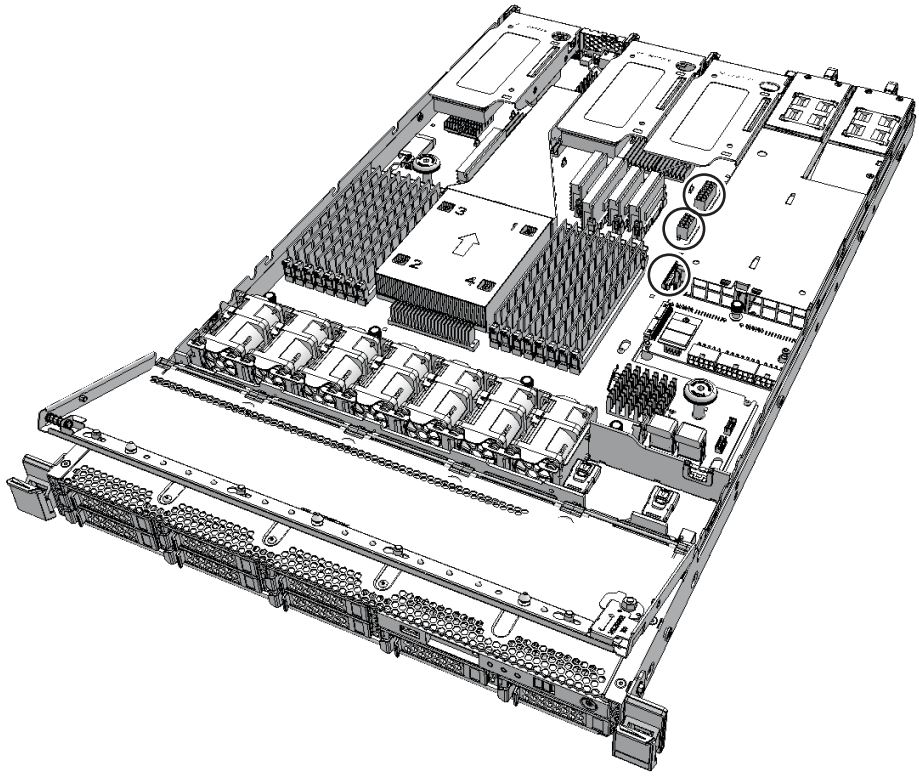
1. **Remove all the power supply units.**
   For details, see "9.4 Removing a Power Supply Unit."
2. **Pull the chassis out of the rack.**
   For details, see "5.3.2 Pulling the chassis out from the rack."
3. **Open the fan cover.**
   For details, see "5.3.3 Opening the fan cover."
4. **Remove the upper cover.**
   For details, see "5.3.4 Removing the upper cover."
5. **Remove the air duct and the PSU backplane cover.**
   For details, see "5.3.5 Removing the air duct and PSU backplane cover."

13.4.2 Removing the PSU backplane

1. **Remove the three (3) cables from the motherboard unit that connect the PSU backplane to the motherboard unit.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

Figure 13-2 Cables of the motherboard unit

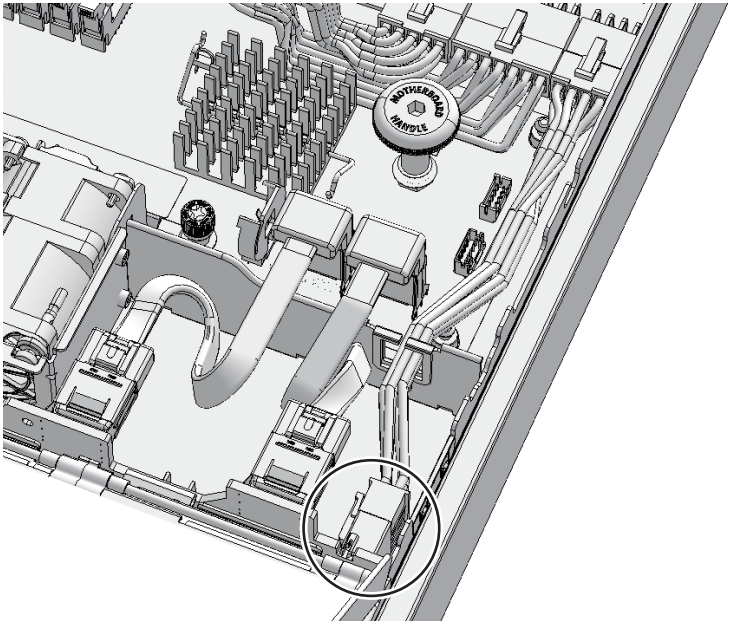


2. **Release the cable guide lock.**
   For details, see "5.3.6 Releasing the cable guide lock."

   If the cable guide does not have a lock, proceed to step 3.

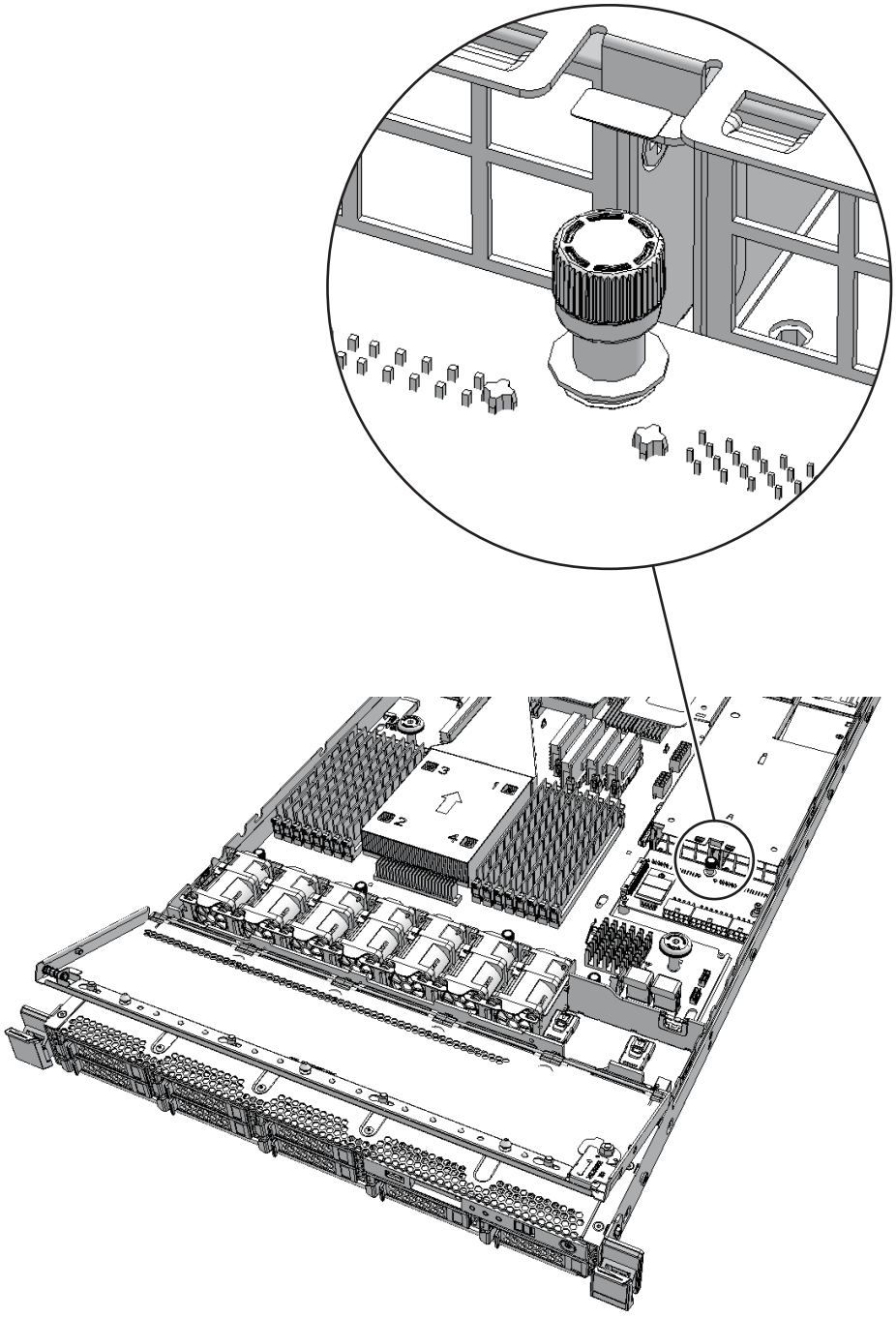
3. **Remove one cable of the HDD backplane which connects the PSU backplane and the HDD backplane.**

Figure 13-3 HDD backplane cables



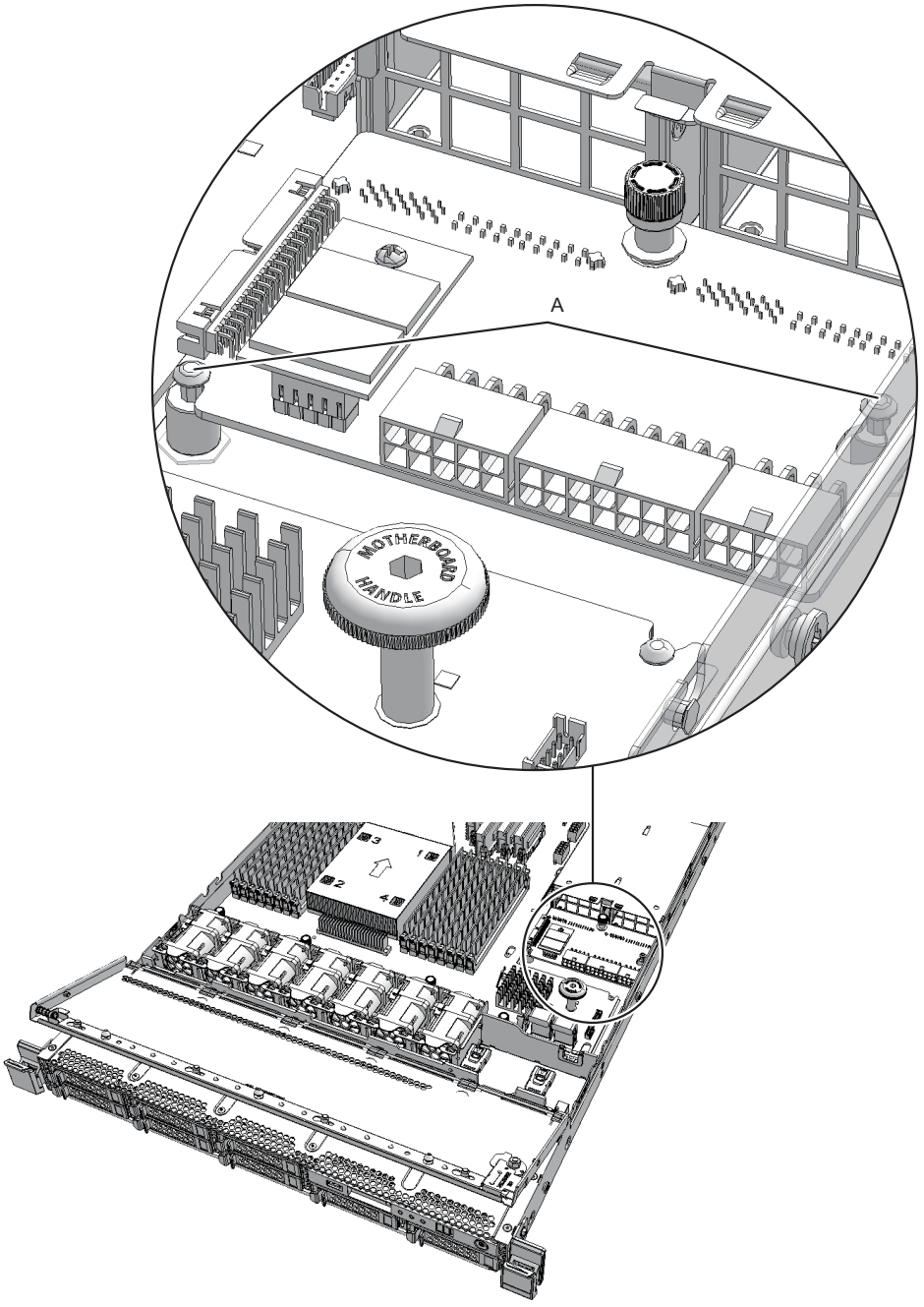
4. **Loosen the screw that secures the PSU backplane.**

Figure 13-4 Screw securing the PSU backplane



5. **Slide the PSU backplane toward the rear of the chassis to release it from the two fixing pins (A in the figure).**

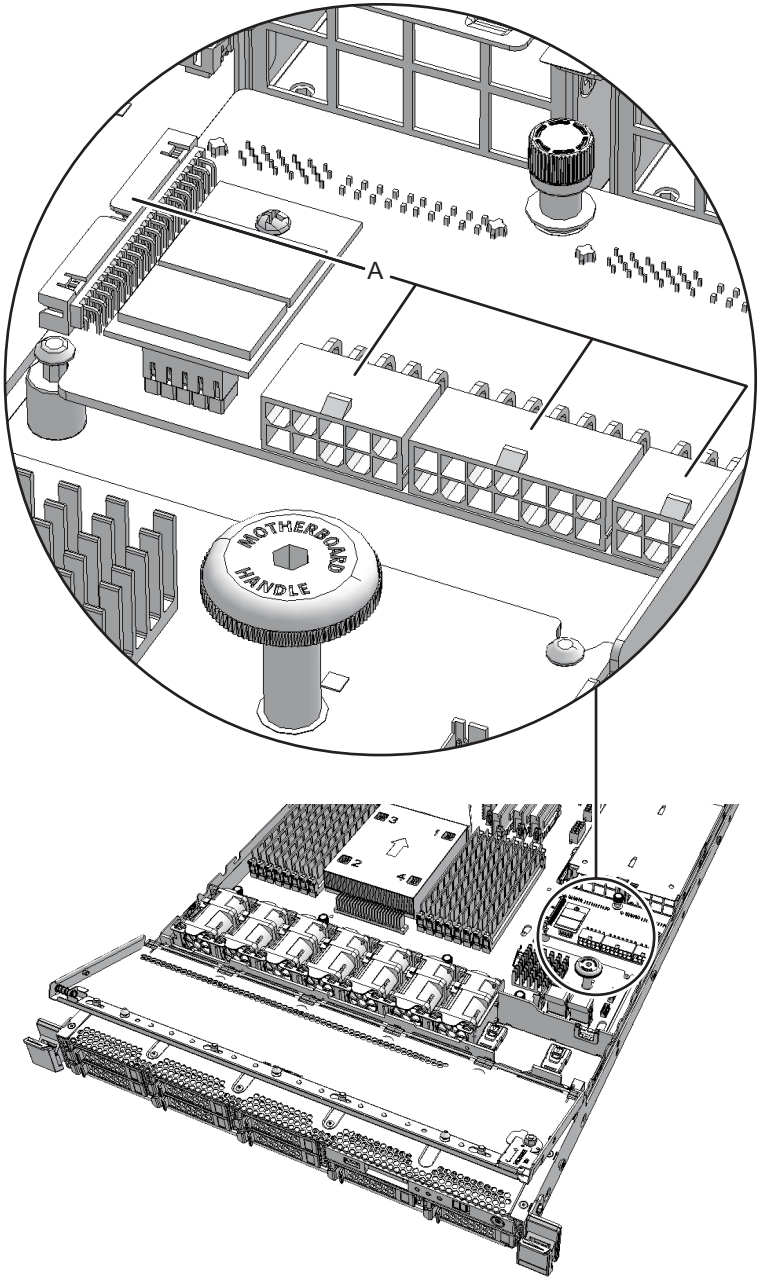
Figure 13-5 Fixing pins of PSU backplane



6. **Lift the PSU backplane and disconnect the four cables (A in the figure) connected to the PSU backplane.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.
Note - Place the removed PSU backplane on a grounded antistatic ESD mat.

Figure 13-6 PSU backplane cables



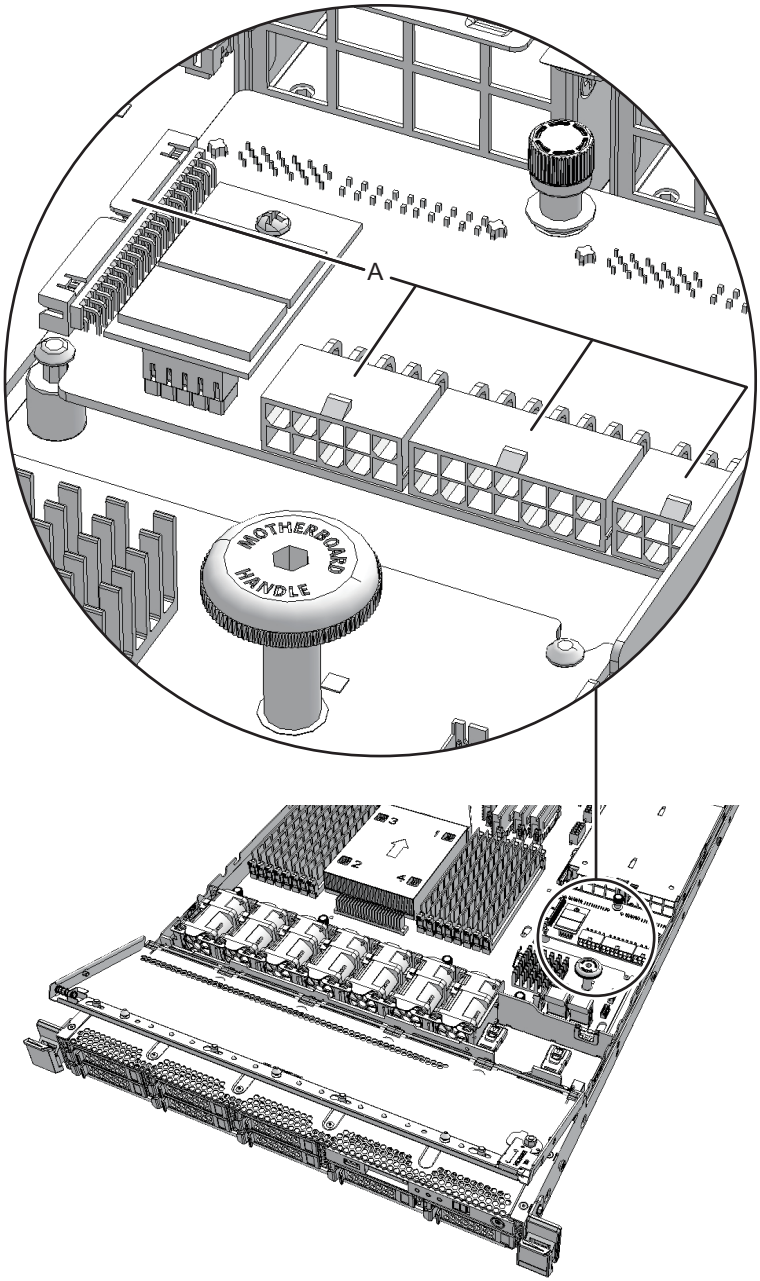
13.5 Installing the PSU Backplane

This section describes the procedures for installing the PSU backplane.

13.5.1 Installing the PSU backplane

1. **Lift the PSU backplane and connect the four cables (A in the figure) to the PSU backplane.**

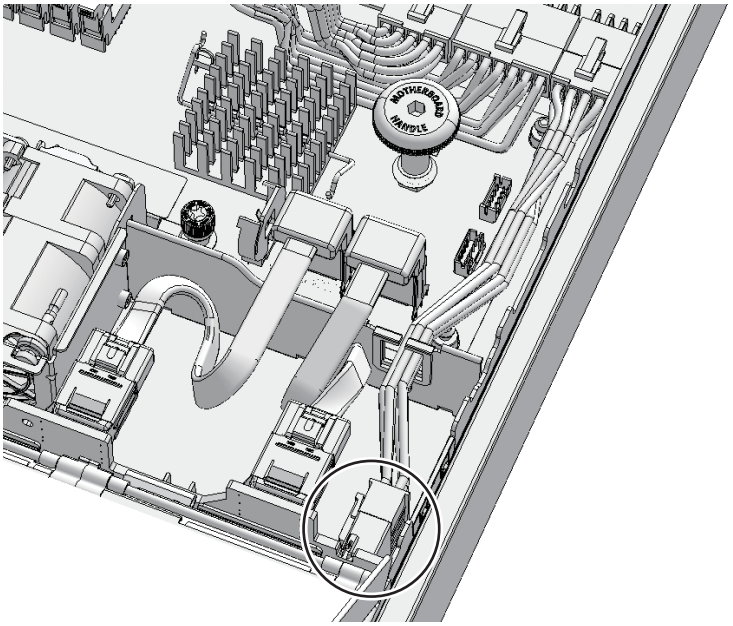
Figure 13-7 PSU backplane cables



2. **Install the PSU backplane.**
3. **Check that the two fixing pins are inserted into the PSU backplane, and then slide the PSU backplane toward the rear of the chassis.**
4. **Tighten the screw securing the PSU backplane.**

5. **Connect one cable connecting the PSU backplane to the HDD backplane.**

Figure 13-8 HDD backplane cables



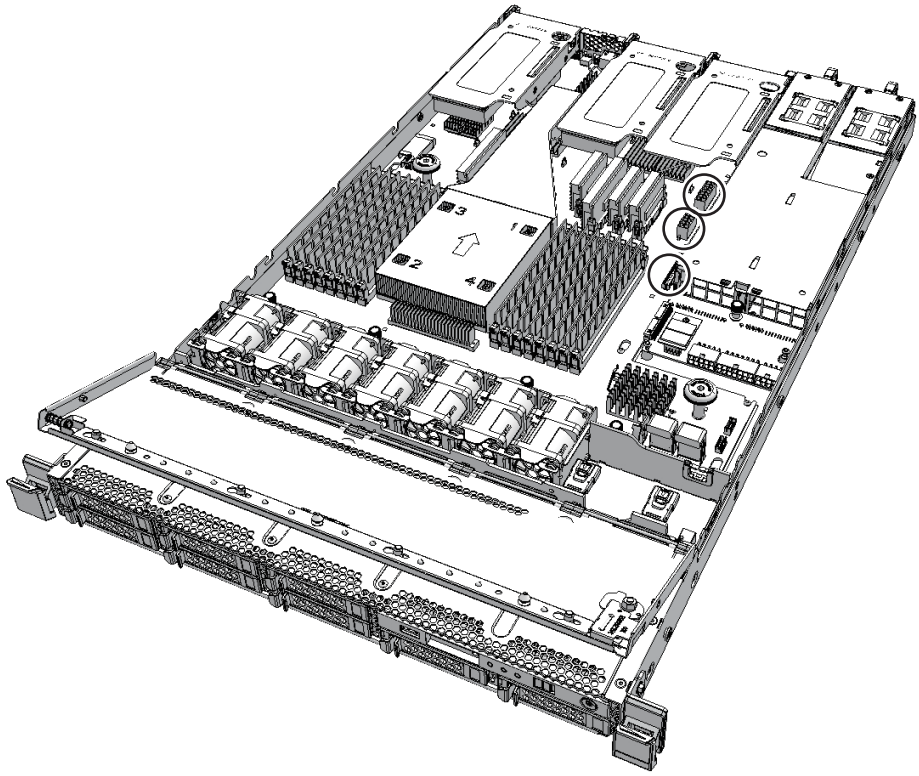
6. **Lock the cable guide after storing the connected cables in the guide.**
   For details, see "6.3.1 Locking the cable guide."

   If the cable guide does not have a lock, proceed to step 7.

7. **Connect the three cables connecting the PSU backplane to the motherboard unit.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.
Note - Make sure that each cable is firmly inserted.

Figure 13-9 Motherboard unit cables



13.5.2 Restoring the chassis

1. **Install the air duct and the PSU backplane cover.**
   For details, see "6.3.2 Installing the air duct and PSU backplane cover."
2. **Install the upper cover.**
   For details, see "6.3.3 Installing the upper cover."
3. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
4. **Install all the power supply units.**
   For details, see "9.5 Installing a Power Supply Unit."

13.6 Restoring the System

This section describes the procedure for restoring the system after installing the PSU

backplane.

1. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
2. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

---

3. **Check that the XSCF STANDBY LED on the operation panel is on.**
4. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
5. **Log in to the XSCF shell.**
6. **Start the system.**
   For details, see "6.2 Starting the System."
7. **Close the rack door.**

Chapter 14

Maintaining the HDD Backplane

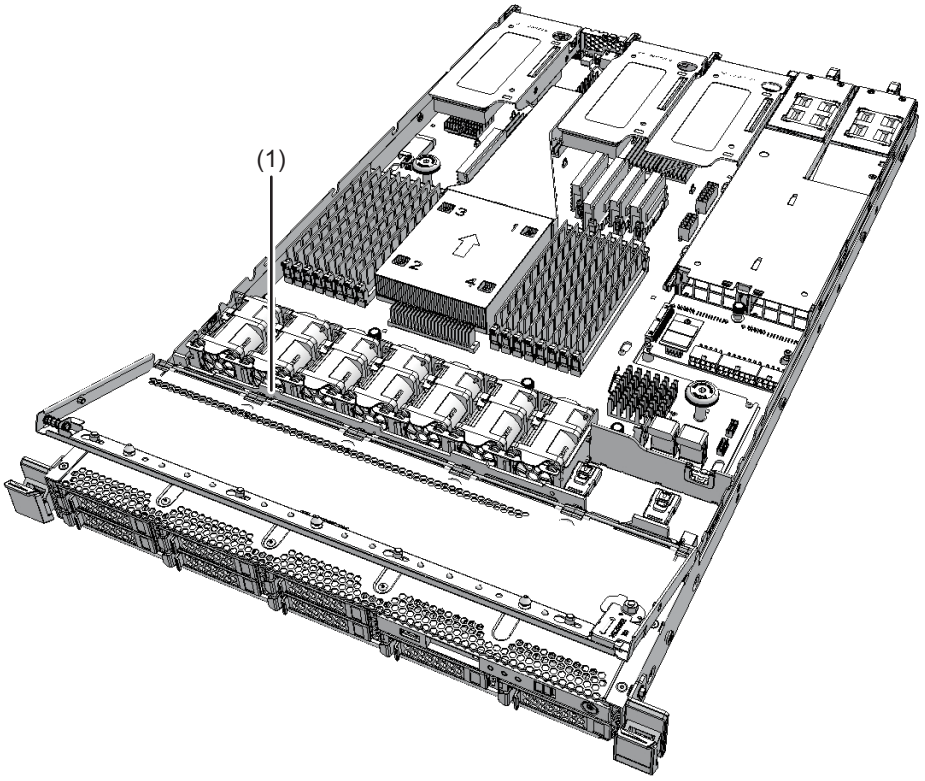
This chapter describes the maintenance procedures for the HDD backplane.

- Position of the HDD Backplane
- Before Maintaining the HDD Backplane
- Enabling the Removal of the HDD Backplane
- Removing the HDD Backplane
- Installing the HDD Backplane
- Restoring the System

14.1 Position of the HDD Backplane

This section describes the position of the HDD backplane.
The HDD backplane has connectors to enable the connection of multiple internal disks.

Figure 14-1 Position of the HDD backplane



Position number	Component
1	HDD backplane (HDDBP)

14.2 Before Maintaining the HDD Backplane

This section describes the types of and procedure for HDD backplane maintenance, as well as some related precautions.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

14.2.1 Types of maintenance

Table 14-1 lists the types of maintenance for the HDD backplane. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 14-1 Maintenance types for HDD backplane

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
-	-	OK

14.2.2 Precautions for replacement

Note the following points when replacing the HDD backplane:

- When removing the HDD backplane, be careful not to damage any components, such as the connectors.

14.3 Enabling the Removal of the HDD Backplane

This section describes the preparations that must be completed prior to removing the HDD backplane.

Caution - To completely shut down the system, all the power cords must be removed. If the power cords are not removed, an electrical failure may occur.

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the HDD backplane requiring maintenance.**

```
XSCF> showlogs error
```

   For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
   For details, see "5.2 Stopping the System."

6. **Remove all the power cords from the power supply unit.**
   For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

14.4 Removing the HDD Backplane

This section describes the procedure for removing the HDD backplane.
Enable removal of the HDD backplane before attempting to remove it. For details, see "14.3 Enabling the Removal of the HDD Backplane."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

14.4.1 Accessing the HDD backplane

1. **Pull the chassis out of the rack.**
   For details, see "5.3.2 Pulling the chassis out from the rack."
2. **Remove all the internal disks or filler units mounted in the chassis.**
   For details, see "11.4 Removing an Internal Disk."

Note - Make a note of the positions of the internal disks before removing them to ensure that they are reinstalled correctly.

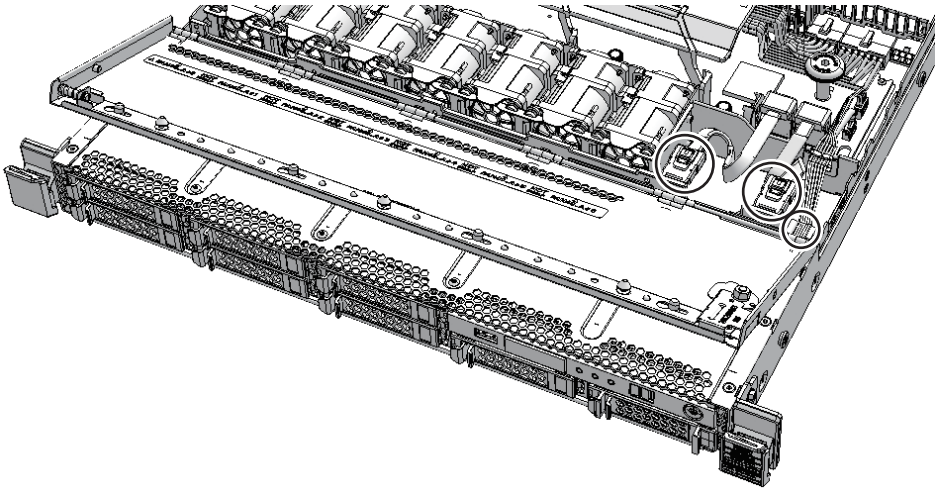
3. **Open the fan cover.**
   For details, see "5.3.3 Opening the fan cover."
4. **Remove the upper cover.**
   For details, see "5.3.4 Removing the upper cover."

14.4.2 Removing the HDD backplane

1. **Disconnect the three cables connected to the HDD backplane.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

Figure 14-2 HDD backplane cables



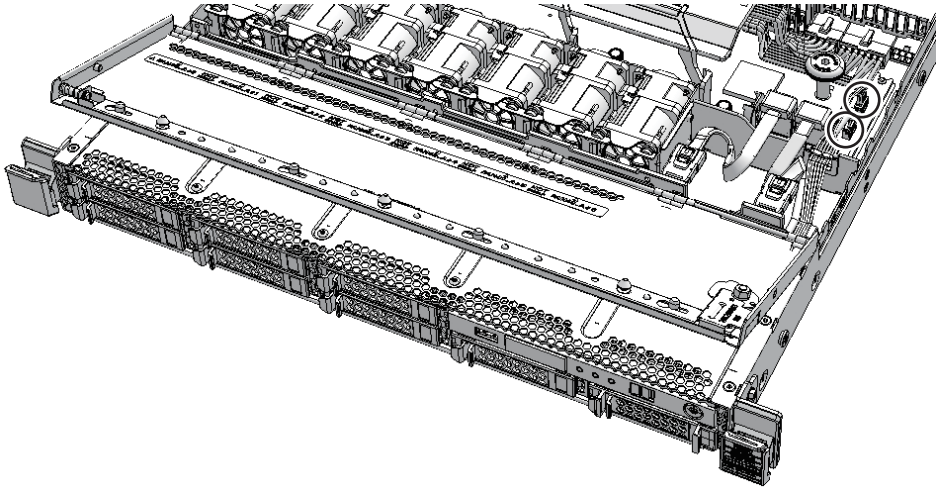
2. **Release the cable guide lock.**
   For details, see "5.3.6 Releasing the cable guide lock."

   If the cable guide does not have a lock, proceed to step 3.

3. **Remove the two cables that connect the operation panel to the motherboard unit.**

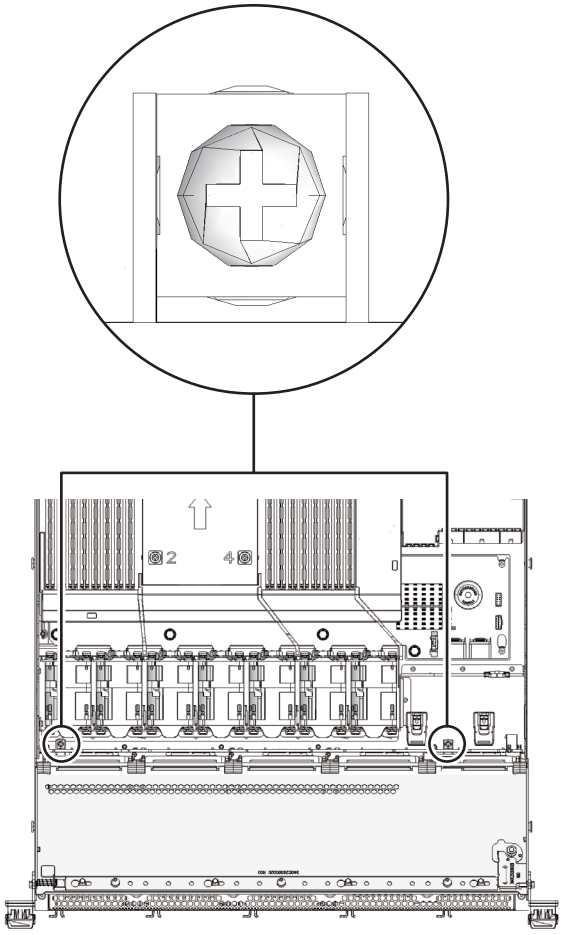
Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

Figure 14-3 Operation panel cables



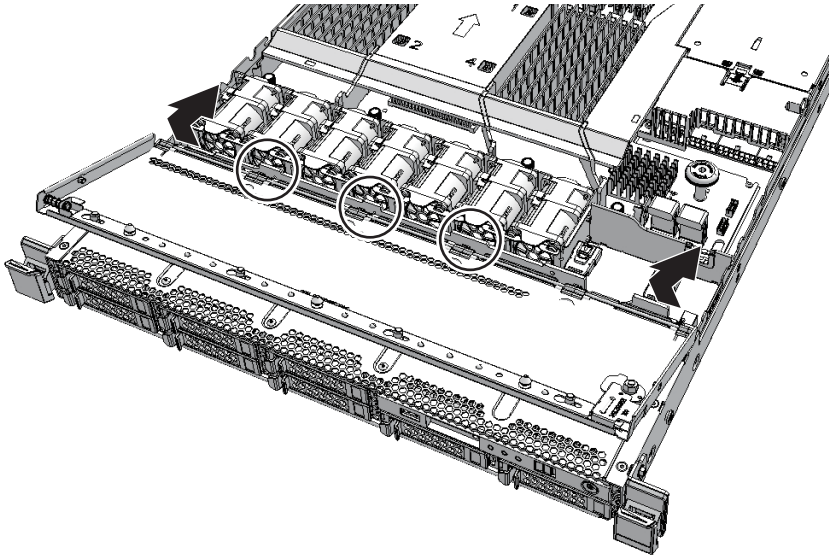
4. **Loosen the two screws securing the HDD backplane.**

Figure 14-4 Screws securing the HDD backplane



5. **Hold both ends of the HDD backplane and lift it to release it from the hooks (three positions).**

Figure 14-5 Hooks on the chassis



6. **Remove the HDD backplane.**

Note - Place the removed HDD backplane on a grounded antistatic ESD mat.

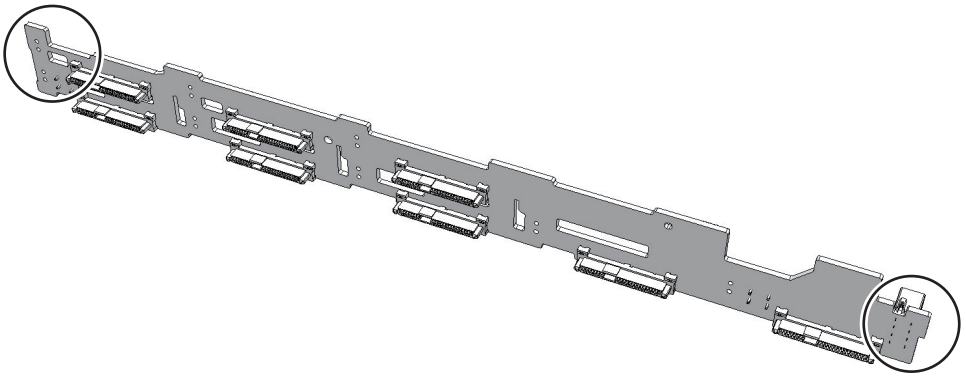
14.5 Installing the HDD Backplane

This section describes the procedure for installing the HDD backplane.

14.5.1 Installing the HDD backplane

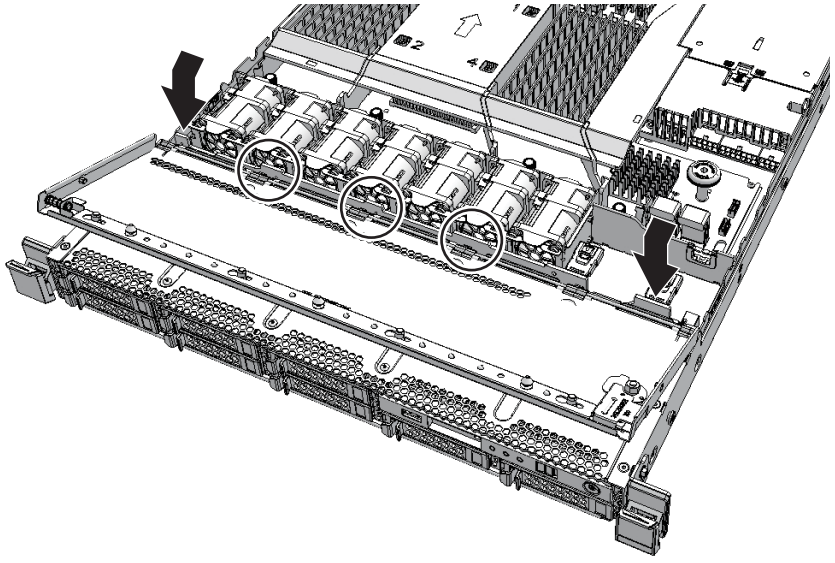
1. **Install the HDD backplane by aligning the notches on both sides.**

Figure 14-6 Notches of HDD backplane



2. **Align the HDD backplane with hooks on the chassis (three positions) and push the backplane into place.**

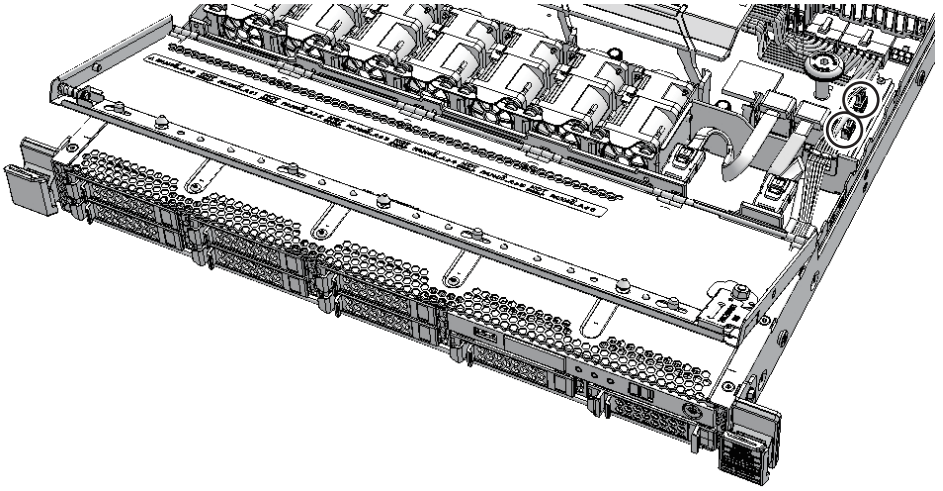
Figure 14-7 Hooks on the chassis



3. **Tighten the two screws securing the HDD backplane.**
4. **Connect the two cables from the operation panel to the motherboard unit.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.
Note - When connecting the cables, insert them firmly. If there is a loose connection, the motherboard unit will be unable to access the operation panel, resulting in an XSCF startup error.

Figure 14-8 Operation panel cables



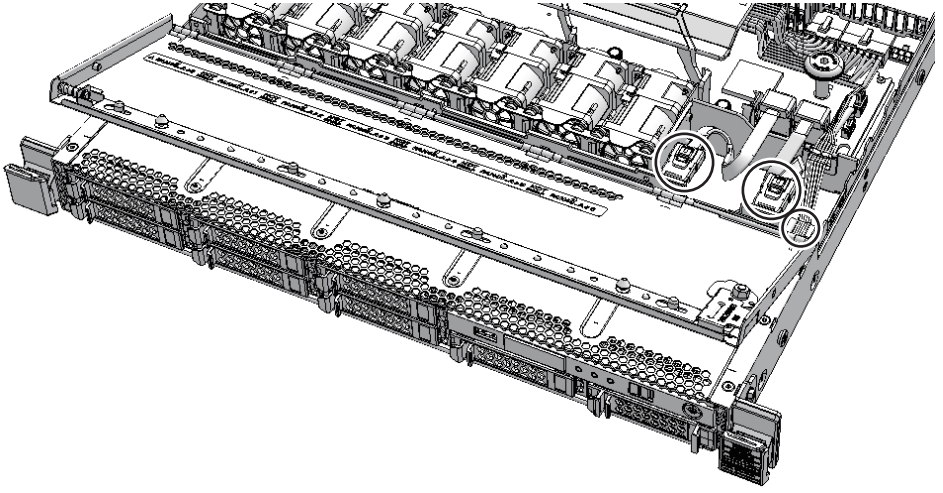
5. **Lock the cable guide after storing the connected cables in the guide.**
   For details, see "6.3.1 Locking the cable guide."

   If the cable guide does not have a lock, proceed to step 6.

6. **Connect the three cables to the HDD backplane.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.
Note - Connect the SAS cable with the metal part facing up.

Figure 14-9 HDD backplane cables



14.5.2 Restoring the chassis

1. **Install the upper cover.**
   For details, see "6.3.3 Installing the upper cover."
2. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
3. **Install all the internal disks or filler units.**
   For details, see "11.5 Installing an Internal Disk."

Note - Install the internal disks in their original positions by referring to the notes that you made prior to the start of maintenance.

---

4. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
5. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

14.6 Restoring the System

This section describes the procedure for restoring the system after installing the HDD backplane.

1. **Check that the XSCF STANDBY LED on the operation panel is on.**
2. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
3. **Log in to the XSCF shell.**
4. **Execute the testsb command to confirm that the HDD backplane requiring maintenance is recognized.**
   When you enter the "-y" option for the testsb command, the system automatically answers "y" (yes) in response to an inquiry.

   The following example shows the diagnosis of system board "00-0".

```
XSCF> testsb -y -p 00-0
```

   During the diagnosis processing, the probe-scsi-all command of the OpenBoot PROM is executed, and the result is displayed.

5. **Start the system.**
   For details, see "6.2 Starting the System."
6. **Close the rack door.**

Chapter 15

Maintaining the Operation Panel

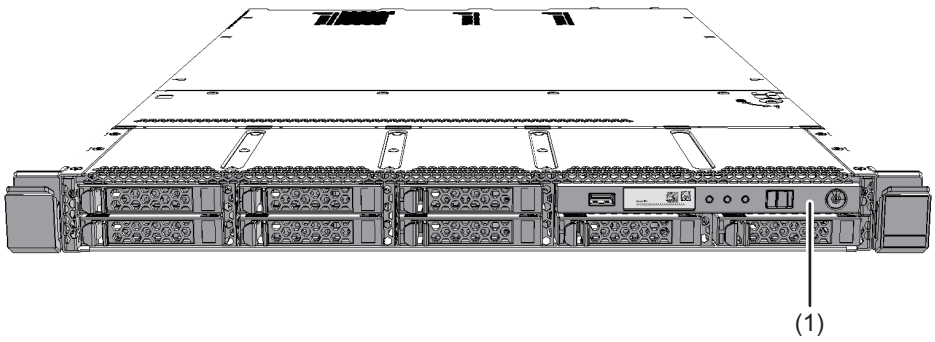
This chapter describes the maintenance procedure for the operation panel.

- Location of the Operation Panel
- Before Maintaining the Operation Panel
- Enabling the Removal of the Operation Panel
- Removing the Operation Panel
- Installing the Operation Panel
- Restoring the System

15.1 Location of the Operation Panel

This section describes the location of the operation panel.

Figure 15-1 Location of the operation panel



Position number	Component
1	Operation panel (OPNL)

15.2 Before Maintaining the Operation Panel

This section describes the types of and the procedure for maintaining the operation panel, as well as some related precautions.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

15.2.1 Types of maintenance

Table 15-1 lists the types of maintenance for the operation panel. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 15-1 Maintenance types for operation panel

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
-	-	OK

15.2.2 Flow of maintenance

Table 15-2 shows the maintenance procedure for the operation panel. See the relevant section.

Table 15-2 Flow of maintenance

Task		Replacement
1	Preparation	15.3
2	Removing the operation panel	15.4
3	Installing the operation panel	15.5
4	System restoration	15.6

15.2.3 Precautions for replacement

Note the following points when replacing the operation panel.

- When removing the operation panel, be careful not to damage the cable or connector.

15.3 Enabling the Removal of the Operation Panel

This section describes the preparations that must be completed prior to the removal of the operation panel.

Caution - To completely shut down the system, all the power cords must be removed. If the power cords are not removed, an electrical failure may occur.

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the operation panel requiring maintenance.**

```
XSCF> showlogs error
```

   For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
   For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
   For details, see "5.2 Stopping the System."
6. **Remove all the power cords from the power supply unit.**
   For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

15.4 Removing the Operation Panel

This section describes the procedure for removing the operation panel.
Enable the removal of the operation panel before attempting to remove it. For details, see "15.3 Enabling the Removal of the Operation Panel."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

15.4.1 Accessing the operation panel

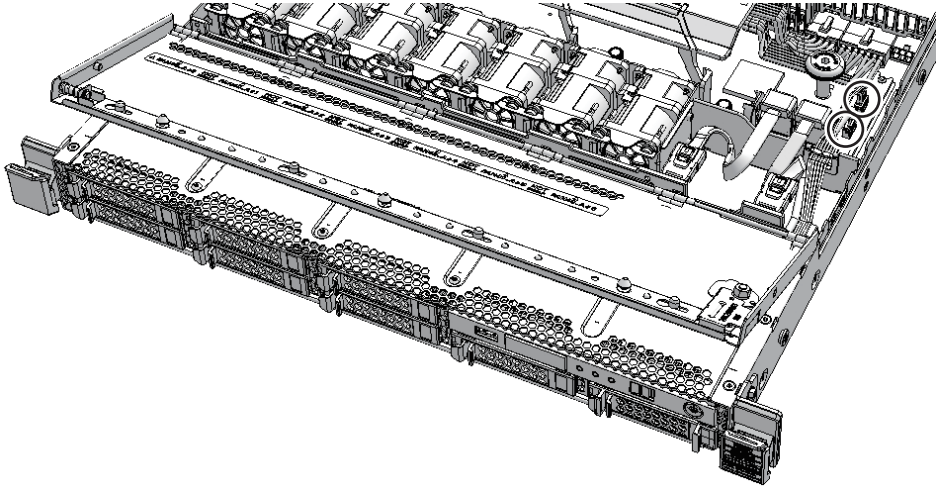
1. **Pull the chassis out of the rack.**
   For details, see "5.3.2 Pulling the chassis out from the rack."
2. **Open the fan cover.**
   For details, see "5.3.3 Opening the fan cover."
3. **Remove the upper cover.**
   For details, see "5.3.4 Removing the upper cover."

15.4.2 Removing the operation panel

1. **Remove the two cables from the motherboard unit that connect the operation panel to the motherboard unit.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

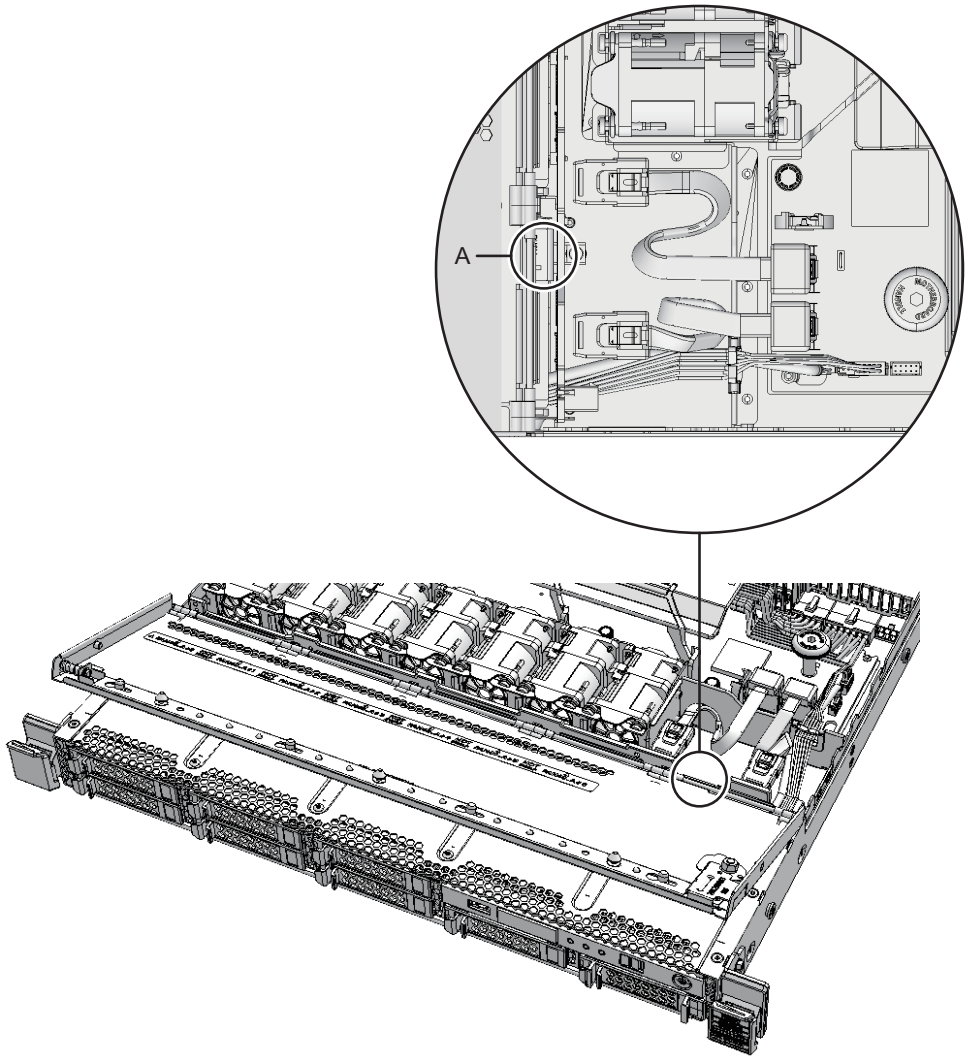
Figure 15-2 Operation panel cables



2. **Pull the operation panel to the front of the chassis while pressing the lever (A**

in the figure) at the back of the operation panel.

Figure 15-3 Operation panel lever



3. **Remove the operation panel while being careful not to damage any cables.**

Note - Place the removed operation panel on a grounded antistatic ESD mat.

15.5 Installing the Operation Panel

This section describes the procedure for installing the operation panel.

15.5.1 Installing the operation panel

1. **Change the mode switch of the operation panel to Service mode.**
2. **Place the operation panel in the installation position and then run the cables from the front of the chassis and insert them.**
3. **Push the operation panel firmly into place.**

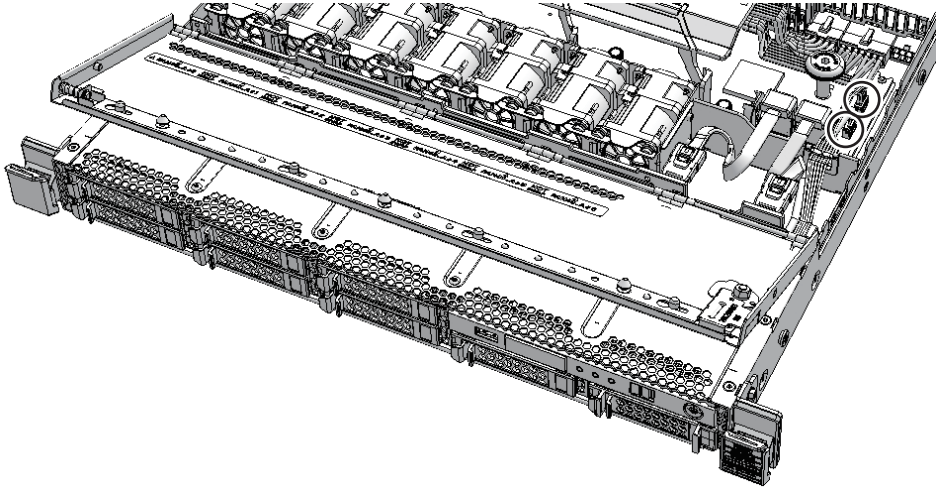
Note - Confirm that the operation panel has been securely installed and fixed.

---

4. **Connect the two cables from the operation panel to the motherboard unit.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.
Note - When connecting the cables, insert them firmly. If there is a loose connection, the motherboard unit will be unable to access the operation panel, resulting in an XSCF startup error.

Figure 15-4 Operation panel cables



15.5.2 Restoring the chassis

1. **Install the upper cover.**
   For details, see "6.3.3 Installing the upper cover."
2. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
3. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
4. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

15.6 Restoring the System

This section describes the procedure for restoring the system after installing the operation panel.

1. **Check that the XSCF STANDBY LED on the operation panel is on.**
2. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
3. **Log in to the XSCF shell.**
4. **Start the system.**
   For details, see "6.2 Starting the System."
5. **Close the rack door.**

Chapter 16

Maintaining the Cable Kit

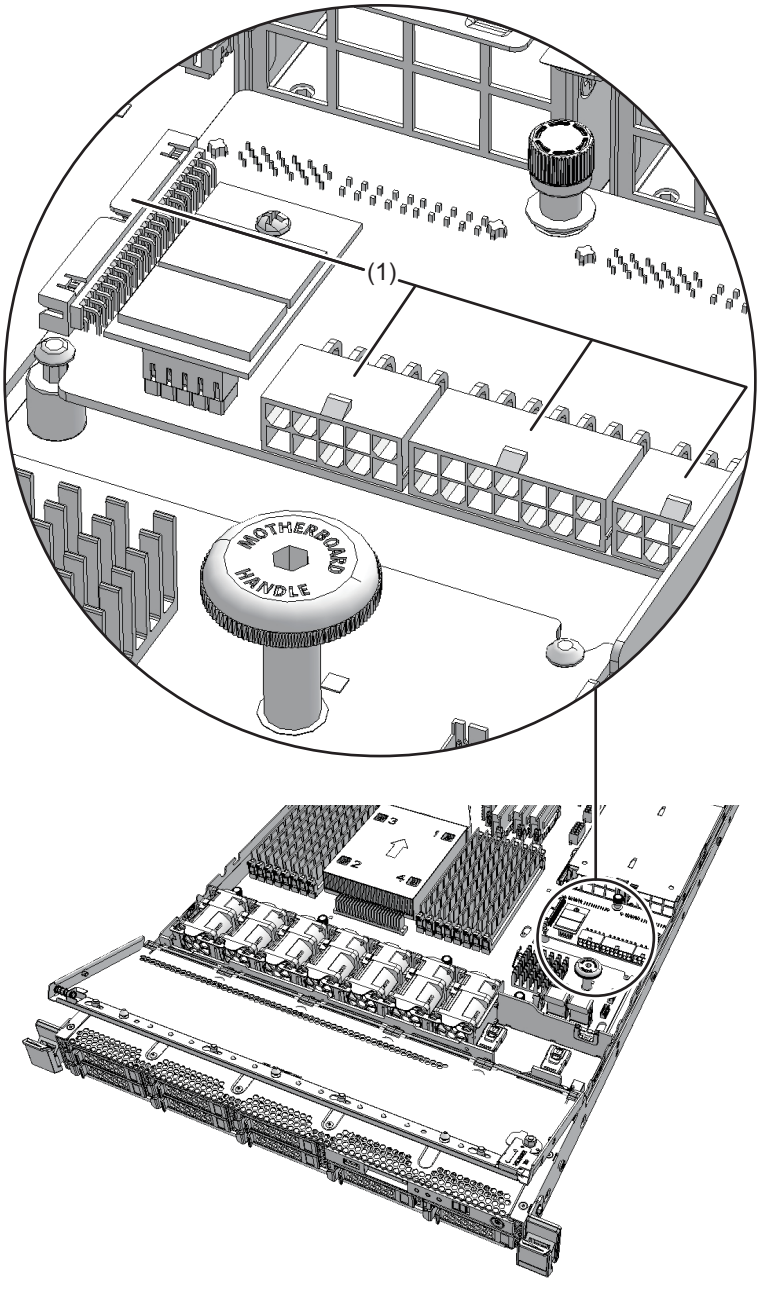
This section describes the maintenance procedure for the cable kit.

- Location of the Cable Kit
- Before Maintaining the Cable Kit
- Enabling the Removal of the Cable Kit
- Removing the Cable Kit
- Installing the Cable Kit
- Restoring the System

16.1 Location of the Cable Kit

This section describes the location of the cable kit.
The cable kit contains three cables for connecting the motherboard unit with the PSU backplane and one cable for connecting the motherboard unit with the HDD backplane.

Figure 16-1 Location of the cable kit



Location number	Component
1	Cable kit

16.2 Before Maintaining the Cable Kit

This section describes the types and procedures of cable kit maintenance.

Note - Read and understand the instructions in this chapter before starting the maintenance work. Also see the contents of "Chapter 1 Before Starting Maintenance Work."

16.2.1 Types of maintenance

Table 16-1 lists the types of maintenance for the cable kit. For the definition of maintenance, see "4.3 Understanding Types of Maintenance."

Table 16-1 Types of maintenance for cable kit

Active/hot	Inactive/hot (system stopped/hot)	Inactive/cold (system stopped/cold)
-	-	OK

16.2.2 Flow of maintenance

Table 16-2 shows the maintenance procedure for the cable kit. See the relevant section.

Table 16-2 Flow of maintenance

Task		Replacement
1	Preparation	16.3
2	Removal of the cable kit	16.4
3	Installation of the cable kit	16.5
4	System restoration	16.6

16.3 Enabling the Removal of the Cable Kit

This section describes the preparations that must be completed prior to removing the cable kit.

Caution - To completely shut down the system, all the power cords must be removed. If the power cords are not removed, an electrical failure may occur.

1. **Open the rack door.**
2. **Log in to the XSCF shell.**
3. **Execute the showlogs command to identify the cable kit requiring maintenance.**

```
XSCF> showlogs error
```

For details, see "3.3.5 Checking log information."

4. **Confirm the hardware and software configurations.**
For details, see "4.2 Confirming the System Configuration."
5. **Stop the system.**
For details, see "5.2 Stopping the System."
6. **Remove all the power cords from the power supply unit.**
For details, see "5.3.1 Removing the power cords."

Note - In the case of a dual power feed, make a note of the positions of the power cords before removing them to ensure that they are reinstalled correctly.

16.4 Removing the Cable Kit

This section describes the procedure for removing the cable kit.
Enable removal of the cable kit before attempting to remove it. For details, see "16.3 Enabling the Removal of the Cable Kit."

Caution - Before you handle any components, wear a wrist strap to ground any static electricity. If you perform this procedure without a wrist strap, individual components or the overall system may be damaged. For details, see "1.4 Notes on Static Electricity."

16.4.1 Accessing the cable kit

1. **Remove all the power supply units.**
For details, see "9.4 Removing a Power Supply Unit."
2. **Pull the chassis out of the rack.**
For details, see "5.3.2 Pulling the chassis out from the rack."

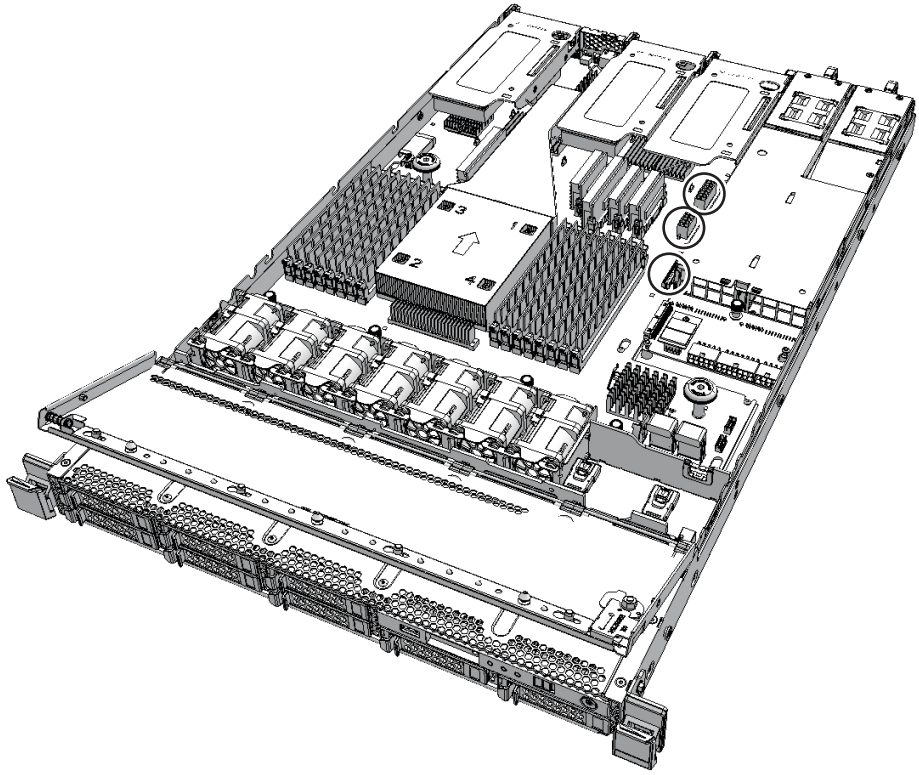
3. **Open the fan cover.**
   For details, see "5.3.3 Opening the fan cover."
4. **Remove the upper cover.**
   For details, see "5.3.4 Removing the upper cover."
5. **Remove the air duct and the PSU backplane cover.**
   For details, see "5.3.5 Removing the air duct and PSU backplane cover."

16.4.2 Removing the cable kit

1. **Remove the three (3) cables from the motherboard unit that connect the PSU backplane to the motherboard unit.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.

Figure 16-2 Cables of the motherboard unit

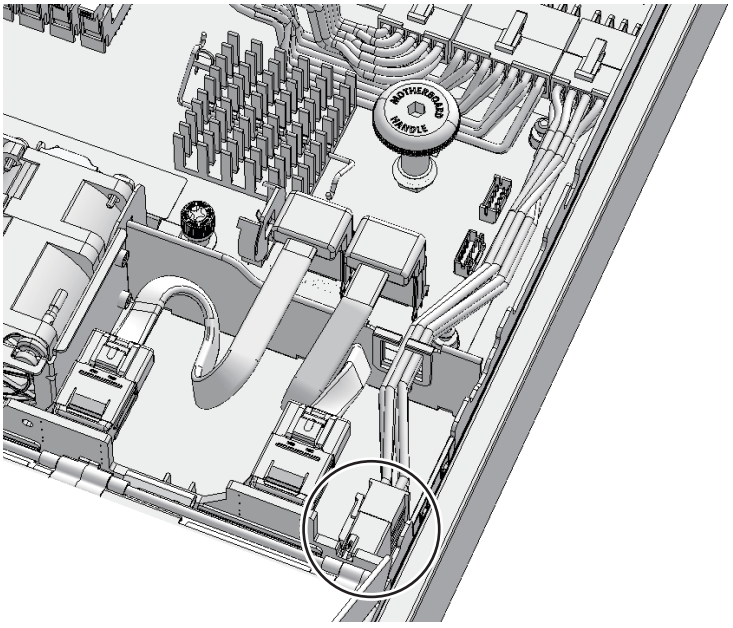


2. **Release the cable guide lock.**
   For details, see "5.3.6 Releasing the cable guide lock."

If the cable guide does not have a lock, proceed to step 3.

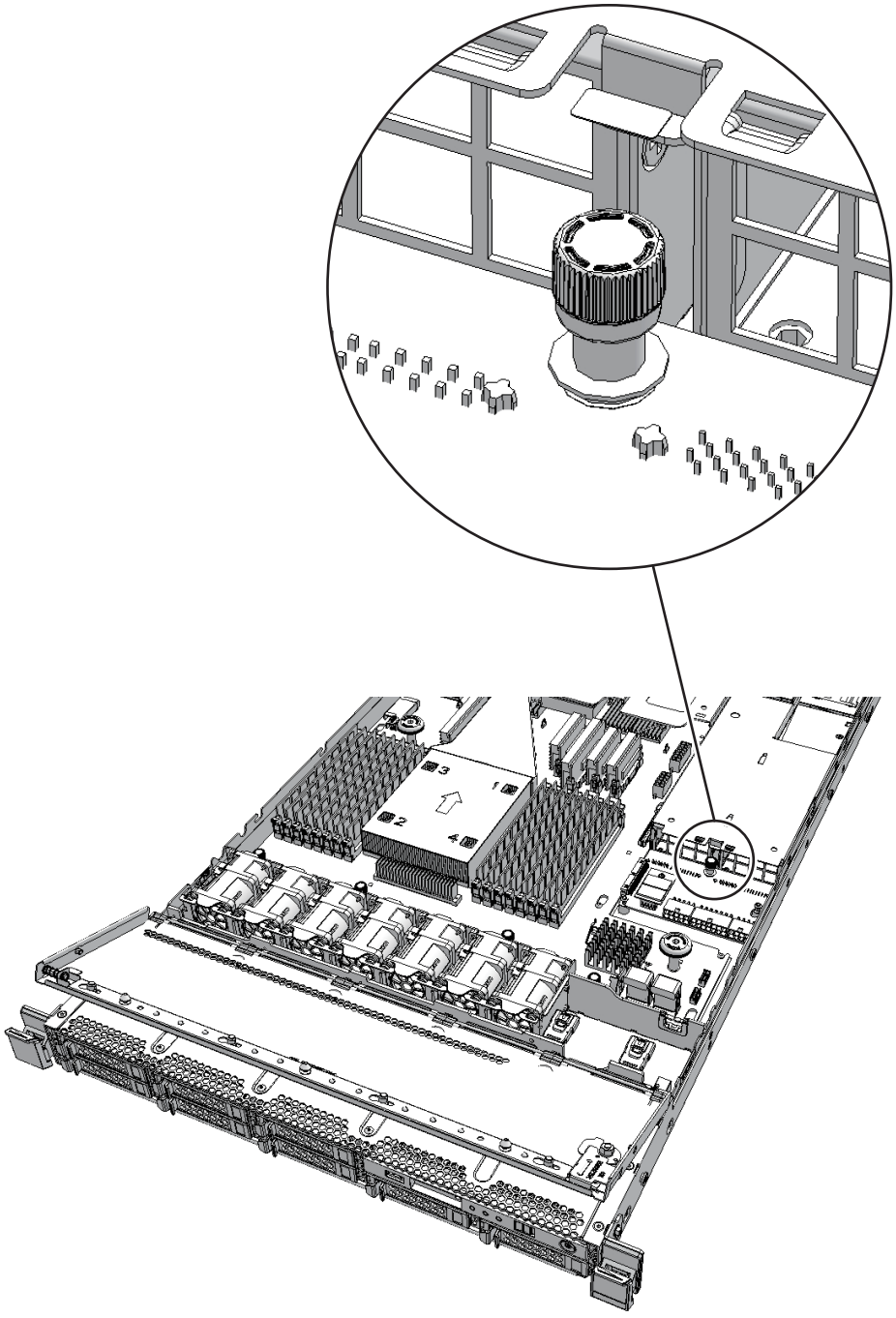
3. **Remove one cable of the HDD backplane which connects the PSU backplane and the HDD backplane.**

Figure 16-3 HDD backplane cables



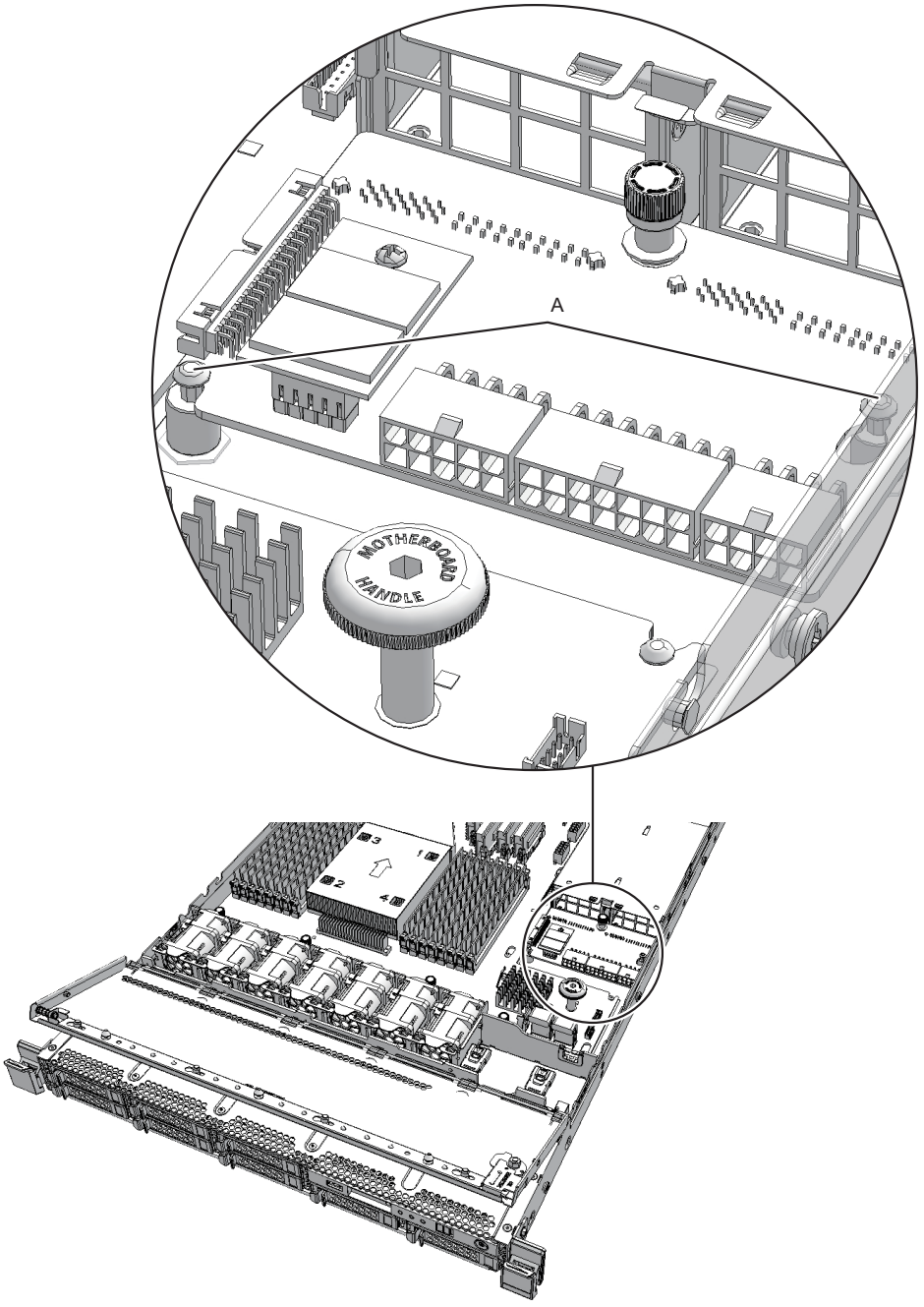
4. **Loosen the screw that secures the PSU backplane.**

Figure 16-4 Screw securing the PSU backplane



5. **Slide the PSU backplane toward the rear of the chassis to release it from the two fixing pins (A in the figure).**

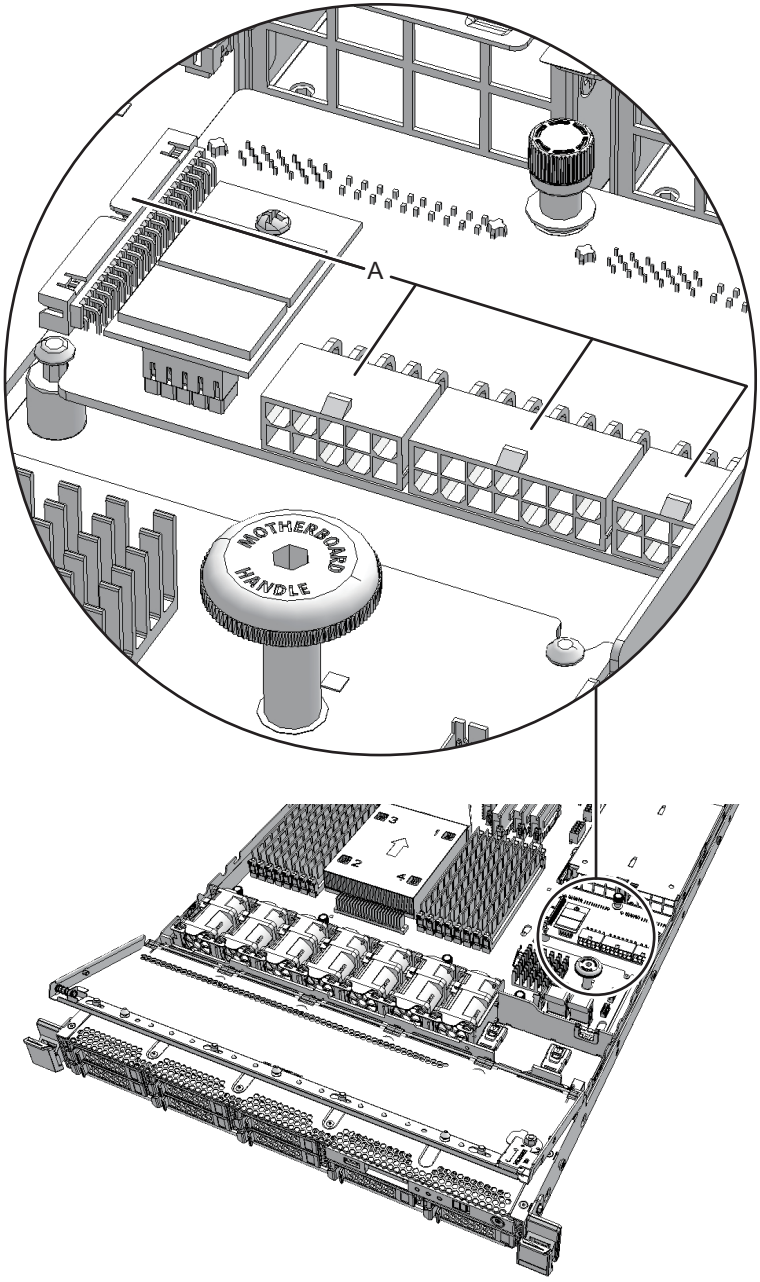
Figure 16-5 Fixing pins of PSU backplane



6. **Lift the PSU backplane and disconnect the four cables (A in the figure) connected to the PSU backplane.**

Note - Record the positions of the cables before removing them to ensure that they are reinstalled correctly.
Note - Place the removed PSU backplane on a grounded antistatic ESD mat.

Figure 16-6 PSU backplane cables



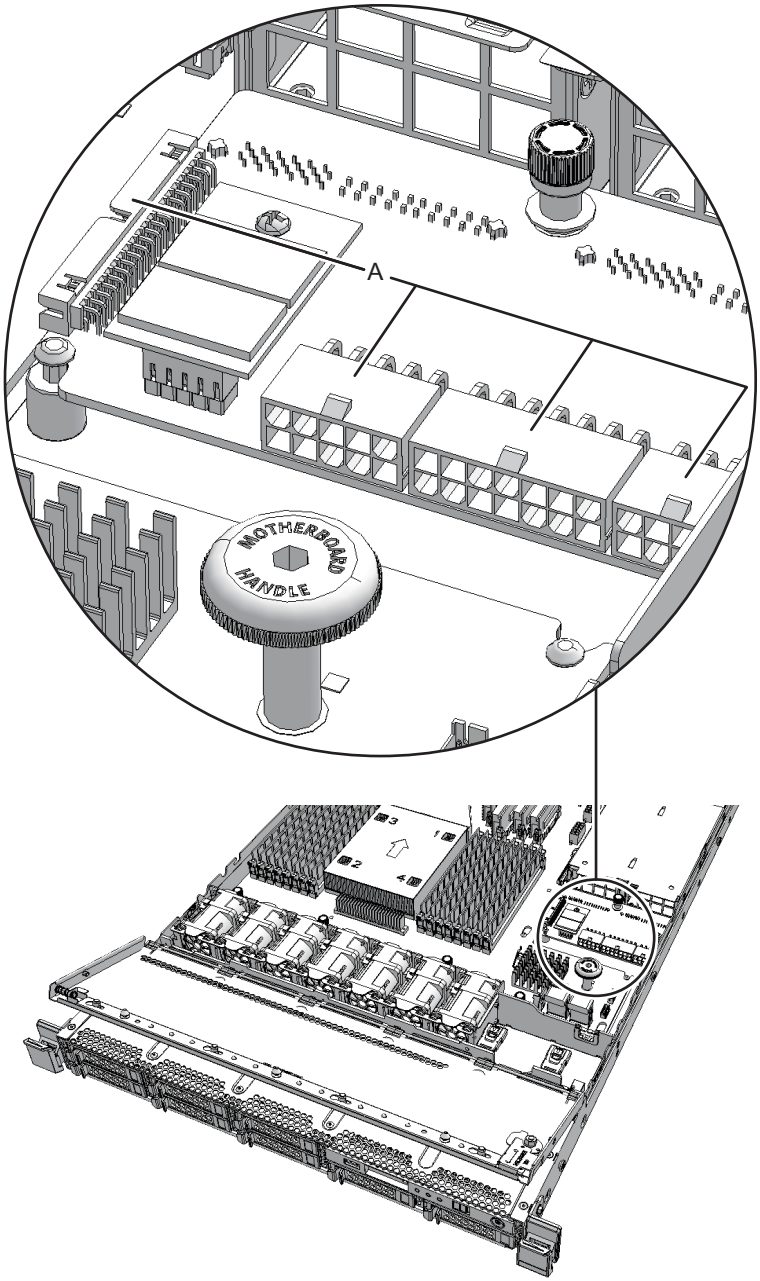
16.5 Installing the Cable Kit

This section describes the procedure for connecting the cable kit.

16.5.1 Installing the cable kit

1. **Lift the PSU backplane and connect the four cables (A in the figure) to the PSU backplane.**

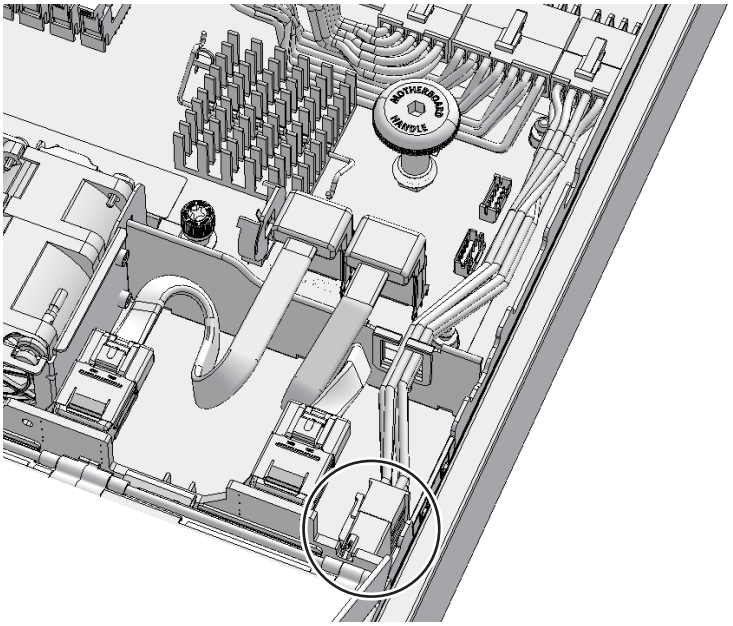
Figure 16-7 PSU backplane cables



2. **Install the PSU backplane.**
3. **Check that the two fixing pins are inserted into the PSU backplane, and then slide the PSU backplane toward the rear of the chassis.**
4. **Tighten the screw securing the PSU backplane.**

5. **Connect one cable connecting the PSU backplane to the HDD backplane.**

Figure 16-8 HDD backplane cables



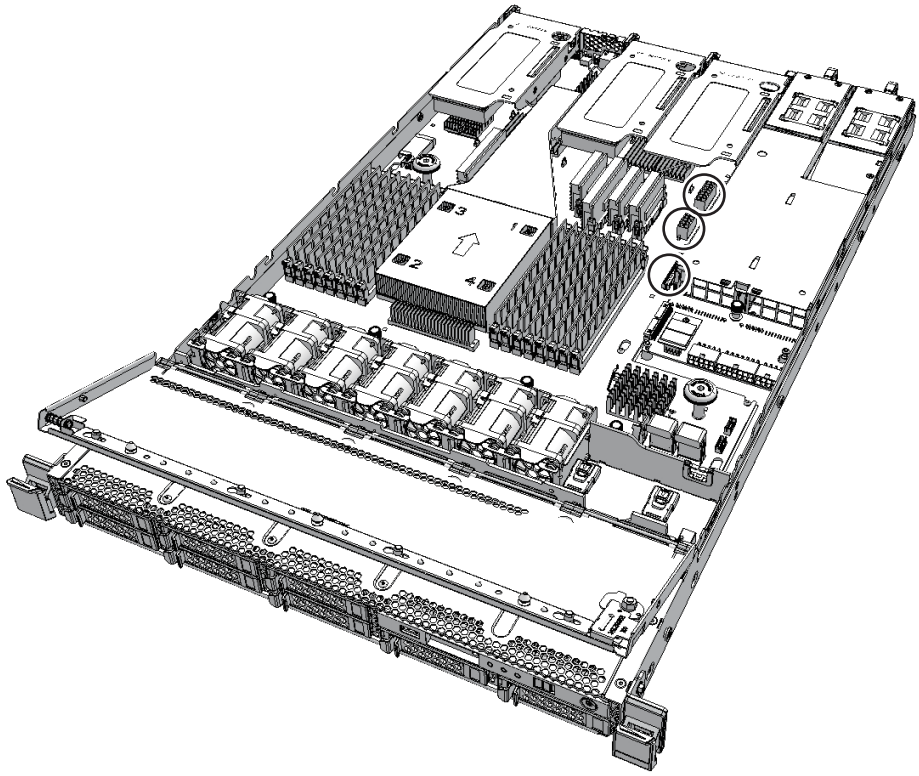
6. **Lock the cable guide after storing the connected cables in the guide.**
   For details, see "6.3.1 Locking the cable guide."

   If the cable guide does not have a lock, then make sure that the cables are stored in the cable guide. For the layout of the cables in the cable guide, see Figure 7-17.

7. **Connect the three cables connecting the PSU backplane to the motherboard unit.**

Note - Connect the cables in their original positions by referring to the record that you made before the start of maintenance.
Note - Make sure that each cable is firmly inserted.

Figure 16-9 Motherboard unit cables



16.5.2 Restoring the chassis

1. **Install the air duct and the PSU backplane cover.**
   For details, see "6.3.2 Installing the air duct and PSU backplane cover."
2. **Install the upper cover.**
   For details, see "6.3.3 Installing the upper cover."
3. **Close the fan cover.**
   For details, see "6.3.4 Closing the fan cover."
4. **Install all the power supply units.**
   For details, see "9.5 Installing a Power Supply Unit."

16.6 Restoring the System

This section describes the procedure for restoring the system after installing the PSU

backplane.

1. **Put the chassis into the rack.**
   For details, see "6.3.5 Putting the chassis into the rack."
2. **Connect all the power cords to the power supply unit.**
   For details, see "6.3.6 Installing the power cords."

Note - In the case of a dual power feed, connect the power cords in their original positions by referring to the record that you made before the start of maintenance.

---

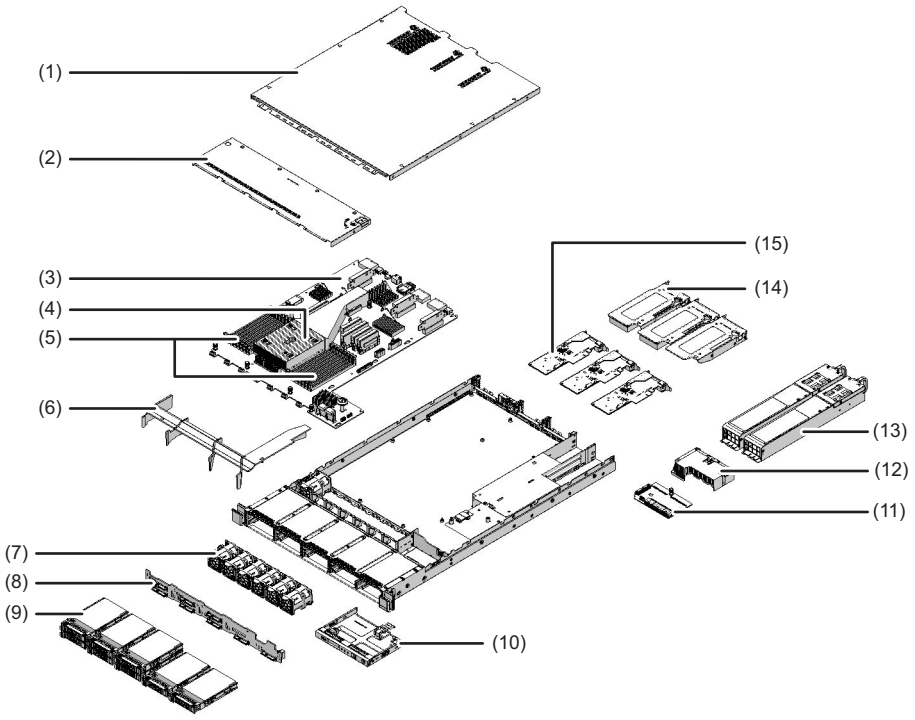
3. **Check that the XSCF STANDBY LED on the operation panel is on.**
4. **Switch the mode switch on the operation panel to Locked mode.**
   For details, see "2.2.2 Control function of the operation panel."
5. **Log in to the XSCF shell.**
6. **Start the system.**
   For details, see "6.2 Starting the System."
7. **Close the rack door.**

Appendix A

Component List

This appendix describes the components constituting the SPARC M10-1. Figure A-1 shows the locations of the components mounted in the chassis.

Figure A-1 Locations of components



Location number	Component
1	Upper cover

Location number	Component
2	Fan cover
3	Motherboard unit
4	CPU
5	Memory
6	Air duct
7	Fan unit
8	HDD backplane
9	Internal disk
10	Operation panel
11	PSU backplane
12	PSU backplane cover
13	Power supply unit
14	PCI Express riser
15	PCI Express card

Appendix B

Component Specifications

This appendix provides the specifications of the components.

- Motherboard Unit
- Power Supply Unit
- Fan Unit
- Internal Disk
- PCI Express Card
- Backplanes
- Operation Panel

B.1 Motherboard Unit

The motherboard unit consists of the following components:

- CPU
- Memory
- XSCF
- PCI Express (PCIe) card
- Fan unit

Power is supplied from the power supply unit to the motherboard unit. Stop the system before performing any maintenance work on the motherboard unit. Perform maintenance work from the top of the chassis.
For the maintenance procedure, see "Chapter 7 Maintaining the Motherboard Unit."

B.2 Power Supply Unit

The power supply units take input power and supply it to the system. The redundant

configuration of the power supply units allows the system to continue operating even if one of the units fails.
Table B-1 lists the specifications of the power supply units.

Table B-1 Power supply unit specifications

Item	Description
Number of power supply units	2
Redundancy	1+1 redundant configuration
Location	Rear of chassis
Active/hot maintenance	Supported
Inactive/cold (system stopped) maintenance	Supported

For the maintenance procedure, see "Chapter 9 Maintaining the Power Supply Units."

B.3 Fan Unit

The chassis is fitted with seven cooling fan units. If a fan unit failure occurs, XSCF detects the error. The redundant configuration of the fan units allows the system to continue running even if a fan unit fails.
Table B-2 lists the specifications of the fan unit.

Table B-2 Specifications of fan unit

Item	Description
Number of fan units	7
Redundancy	6+1 redundant configuration
Location	Rear of internal disk
Active/hot maintenance	Supported
Inactive/cold (system stopped) maintenance	Supported

For the maintenance procedure, see "Chapter 10 Maintaining the Fan Units."

B.4 Internal Disk

The chassis supports the mounting of up to eight hard disk drives (HDDs) or solid state drives (SSDs).
Table B-3 lists the specifications of the internal disk.

Table B-3 Specifications of internal disk

Item	Description
Number of HDDs/SSDs	8
Interface	SAS
Location	Front of chassis
Active/hot maintenance	Supported (Possible with any device other than the boot device. With a redundant configuration, however, this is also possible with the boot device.)
Inactive/cold (system stopped) maintenance	Supported

For the maintenance procedure, see "Chapter 11 Maintaining the Internal Disks."

B.5 PCI Express Card

The chassis supports the mounting of up to three low-profile PCIe cards. Table B-4 lists the specifications of the PCIe card.

Table B-4 Specifications of PCIe card

Item	Description
Maximum number of PCIe cards	3
Location	Rear of chassis
Active/hot maintenance	Unsupported
Inactive/cold (system stopped) maintenance	Supported

For the maintenance procedure, see "Chapter 12 Maintaining the PCI Express Cards."

B.6 Backplanes

There are the following two types of backplane:

- HDD backplane (A in the figure)
- PSU backplane (B in the figure)

The backplane is a unit with connectors for mounting replaceable units in the chassis. The PSU backplane carries memory that stores identification information and the user setting information.

Figure B-1 Location of HDD backplane

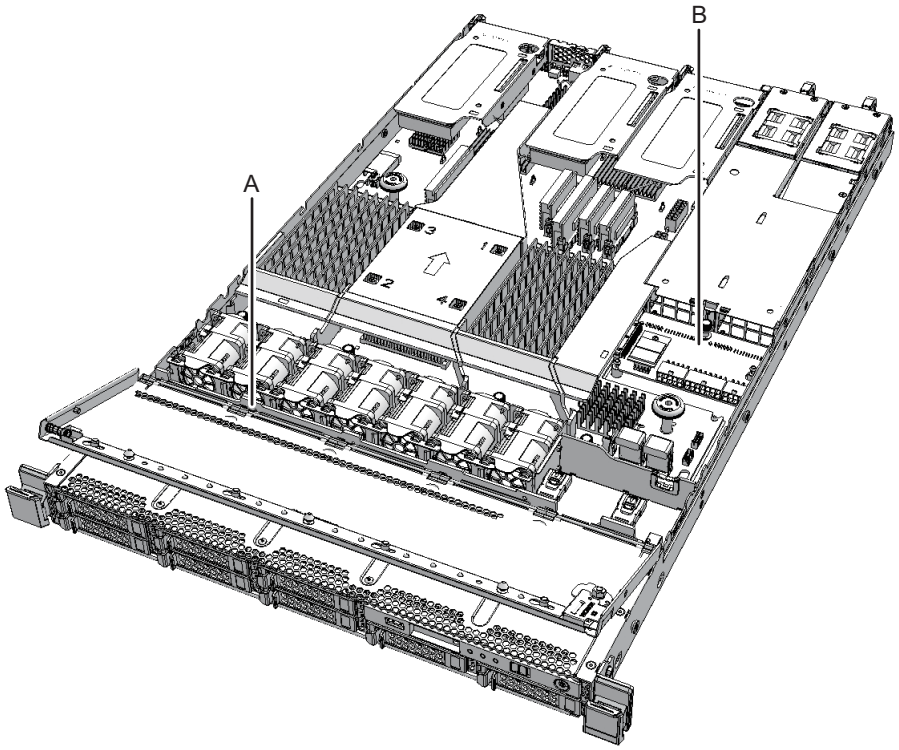


Table B-5 lists the specifications of the HDD backplane and Table B-6 lists the specifications of the PSU backplane.

Table B-5 Specifications of HDD backplane

Item	Description
Number of HDD backplanes	1
Location	Inside a chassis
Active/hot maintenance	Unsupported
Inactive/cold (system stopped) maintenance	Supported

Table B-6 Specifications of PSU backplane

Item	Description
Number of PSU backplanes	1
Location	Inside a chassis
Active/hot maintenance	Unsupported
Inactive/cold (system stopped) maintenance	Supported

For the maintenance procedure, see "Chapter 13 Maintaining the PSU Backplane" or

"Chapter 14 Maintaining the HDD Backplane."

B.7 Operation Panel

The operation panel is installed on the front of the chassis. It displays the system status and is used to operate the system.
Table B-7 lists the specifications of the operation panel.

Table B-7 Specifications of operation panel

Item	Description
Number of operation panels	1
Location	Front of chassis
Active/hot maintenance	Unsupported
Inactive/cold (system stopped) maintenance	Supported

For the maintenance procedure, see "Chapter 15 Maintaining the Operation Panel."

Appendix C

Oracle Solaris Commands Related to Troubleshooting

This appendix describes how to use Oracle Solaris commands to display fault diagnosis information and to take countermeasures. The commands listed here are useful for determining whether there are problems in the system, the network, or some other system connected through the network.

- iostat(1M) Command
- prtdiag(1M) Command
- prtconf(1M) Command
- netstat(1M) Command
- ping(1M) Command
- ps(1) Command
- prstat(1M) Command

C.1 iostat(1M) Command

The iostat(1M) command is used to regularly report the CPU usage status, as well as the terminal status, the drive status, and the I/O status.
Table C-1 lists the options of the iostat(1M) command and how those options are useful for system troubleshooting.

Table C-1 iostat(1M) command options

Option	Description	Application
No options	Reports the status of a local I/O device.	Allows you to view the device status concisely in 3 lines.
-c	Reports, as ratios, the length of time that the system has been in user mode, system mode, I/O waiting, and idling.	Allows you to view the CPU status as a concise report.

Table C-1 iostat(1M) command options *(continued)*

Option	Description	Application
-e	Displays a summary of statistics on device errors. Displayed items are the total number of errors, hardware errors, software errors, and transfer errors.	Allows you to view the accumulated number of errors as a concise table and to identify potentially failed I/O devices.
-E	Displays statistics on all the device errors.	Allows you to view the device information (manufacturer, model number, serial number, size, and errors).
-n	Displays the names in a descriptive form.	Allows you to identify devices with a descriptive display.
-x	Reports the extended drive statistics for individual drives. Statistics are displayed in a table format. Similar to the -e option, but differs in that it provides rate information.	Allows you to find internal devices and other I/O devices on the network whose performance is low.

The following example shows the iostat(1M) command output.

```
# iostat -En
c5t50000393D85129FAd0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: TOSHIBA  Product: MBF2300RC        Revision: 3706 Serial No:
EB25PC201AL6
Size: 300.00GB <300000000000 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
c3t50000393D851FDAAd0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: TOSHIBA  Product: MBF2300RC        Revision: 3706 Serial No:
EB25PC201AMS
Size: 300.00GB <300000000000 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
c4t50000393D822D2B6d0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: TOSHIBA  Product: MBF2300RC        Revision: 3706 Serial No:
EB25PC2015P8
Size: 300.00GB <300000000000 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
c2t50000393E8001BB6d0 Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: TOSHIBA  Product: MBF2300RC        Revision: 3706 Serial No:
EB25PC301AV6
Size: 300.00GB <300000000000 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
#
```

C.2 prtdiag(1M) Command

The prtdiag(1M) command displays the system settings and diagnosis information. Diagnosis information displays FRUs in the system that experienced errors.
The prtdiag(1M) command is in the following directory: /usr/platform/platform-name/sbin/.
The prtdiag(1M) command may display a slot number that differs from those supposed to be displayed according to other parts of this manual. This does not indicate a fault.
Table C-2 lists the options of the prtdiag(1M) command and how those options are useful for troubleshooting.

Table C-2 prtdiag(1M) command options

Option	Description	Application
No options	Displays a list of components.	Allows you to check the CPU information, the memory configuration, the mounted PCI Express (PCIe) cards, the OpenBootPROM version, the mode switch status, and the CPU operational mode.
-v	Displays information in detailed (Verbose) mode.	In addition to the content displayed when no option is specified, this option allows you to check detailed information of the PCIe card.

The following example shows the prtdiag(1M) command output.

```
# prtdiag -v
System Configuration:  Oracle Corporation  sun4v SPARC M10-4
Memory size: 64000 Megabytes

================================ Virtual CPUs ================================


CPU ID Frequency Implementation         Status
------ --------- ---------------------- -------
0      3000 MHz  SPARC64-X              on-line
1      3000 MHz  SPARC64-X              on-line
2      3000 MHz  SPARC64-X              on-line
3      3000 MHz  SPARC64-X              on-line
4      3000 MHz  SPARC64-X              on-line
5      3000 MHz  SPARC64-X              on-line
6      3000 MHz  SPARC64-X              on-line
7      3000 MHz  SPARC64-X              on-line
8      3000 MHz  SPARC64-X              on-line
9      3000 MHz  SPARC64-X              on-line
10     3000 MHz  SPARC64-X              on-line
```

```
11      3000 MHz  SPARC64-X              on-line

------------------------Omitted-------------------------

59      3000 MHz  SPARC64-X              on-line
60      3000 MHz  SPARC64-X              on-line
61      3000 MHz  SPARC64-X              on-line
62      3000 MHz  SPARC64-X              on-line
63      3000 MHz  SPARC64-X              on-line

======================== Physical Memory Configuration ========================
Segment Table:
-----------------------------------------------------------------
Base            Segment  Interleave   Bank     Contains
Address         Size     Factor       Size     Modules
-----------------------------------------------------------------
0x0             32 GB    4            8 GB     /BB0/CMUL/CMP0/MEM00A
                                               /BB0/CMUL/CMP0/MEM01A
                                      8 GB     /BB0/CMUL/CMP0/MEM02A
                                               /BB0/CMUL/CMP0/MEM03A
                                      8 GB     /BB0/CMUL/CMP0/MEM04A
                                               /BB0/CMUL/CMP0/MEM05A
                                      8 GB     /BB0/CMUL/CMP0/MEM06A
                                               /BB0/CMUL/CMP0/MEM07A

0x200000000000  32 GB    4            8 GB     /BB0/CMUL/CMP1/MEM10A
                                               /BB0/CMUL/CMP1/MEM11A
                                      8 GB     /BB0/CMUL/CMP1/MEM12A
                                               /BB0/CMUL/CMP1/MEM13A
                                      8 GB     /BB0/CMUL/CMP1/MEM14A
                                               /BB0/CMUL/CMP1/MEM15A
                                      8 GB     /BB0/CMUL/CMP1/MEM16A
                                               /BB0/CMUL/CMP1/MEM17A


================================ IO Devices ================================
Slot +             Bus   Name +                              Model      Speed
Status             Type  Path
------------------------------------------------------------------------------
/BB0/CMUL/SASHBA   PCIE  scsi-pciex1000,87                   LSI,2308_2 5.0GTx8
                         /pci@8000/pci@4/pci@0/pci@0/scsi@0
/BB0/CMUL/NET0     PCIE  network-pciex14e4,1656                          2.5GTx1
                         /pci@8000/pci@4/pci@0/pci@9/network@0
/BB0/CMUL/NET1     PCIE  network-pciex14e4,1656                          2.5GTx1
                         /pci@8000/pci@4/pci@0/pci@9/network@0,1
/BB0/CMUL/NET2     PCIE  network-pciex14e4,1656                          2.5GTx1
                         /pci@8000/pci@4/pci@0/pci@a/network@0
/BB0/CMUL/NET3     PCIE  network-pciex14e4,1656                          2.5GTx1
                         /pci@8000/pci@4/pci@0/pci@a/network@0,1
/BB0/PCI0          PCIE  ethernet-pciex1077,8000                        5.0GTx4
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@0/ethernet@0
/BB0/PCI0          PCIE  ethernet-pciex1077,8000                        5.0GTx4
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@0/ethernet@0,1
```

```
/BB0/PCI0          PCIE  QLGC,qlc-pciex1077,8001           QLE8152    5.0GTx4
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@0/QLGC,qlc@0,2
/BB0/PCI0          PCIE  QLGC,qlc-pciex1077,8001           QLE8152    5.0GTx4
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@0/QLGC,qlc@0,3
/BB0/PCI0          PCIE  emlx-pciex10df,f100              LPe12002-M8-FJ2.5GTx8
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@10/pci@0/pci@0/emlx@0
/BB0/PCI0          PCIE  emlx-pciex10df,f100              LPe12002-M8-FJ2.5GTx8
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@10/pci@0/pci@0/emlx@0,1
/BB0/PCI0          PCIE  network-pciex108e,abcd            SUNW,pcie-qgc2.5GTx8
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@11/pci@0/pci@0/network@0
/BB0/PCI0          PCIE  network-pciex108e,abcd            SUNW,pcie-qgc2.5GTx8
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@11/pci@0/pci@0/network@0,1
/BB0/PCI0          PCIE  network-pciex108e,abcd            SUNW,pcie-qgc2.5GTx8
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@11/pci@0/pci@0/network@0,2
/BB0/PCI0          PCIE  network-pciex108e,abcd            SUNW,pcie-qgc2.5GTx8
                         /pci@8100/pci@4/pci@0/pci@0/pci@0/pci@0/pci@0/pci@1/
pci@0/pci@11/pci@0/pci@0/network@0,3
MB                 PCIX  usb-pciclass,0c0310                              --
                         /pci@8000/pci@4/pci@0/pci@1/pci@0/usb@4
MB                 PCIX  usb-pciclass,0c0320                              --
                         /pci@8000/pci@4/pci@0/pci@1/pci@0/usb@4,1

============================ Environmental Status ============================

============================ FRU Status ============================
Location                          Name      Status
------------------------------------------------------
                                  SYS       enabled

============================ FW Version ============================
Version
------------------------------------------------------------
2002

====================== System PROM revisions ======================
Version
------------------------------------------------------------
OBP 4.34.0 2012/08/15 17:56

Chassis Serial Number
---------------------
2081203001
#
```

C.3 prtconf(1M) Command

The prtconf(1M) command displays the configured devices.
The prtconf(1M) command identifies hardware units recognized by Oracle Solaris. When a software application experiences a hardware-related issue even though there is no hardware error, this command allows you to check whether Oracle Solaris recognizes the hardware and whether the hardware drivers are loaded.
Table C-3 lists the options of the prtconf(1M) command and how those options are useful for troubleshooting.

Table C-3 prtconf(1M) command options

Option	Description	Application
No options	Displays the device tree for the devices recognized by Oracle Solaris.	A hardware device is regarded as operating normally if it is recognized. If the message "(driver not attached)" is displayed for a device or a sub-device, the driver for the device is corrupted or does not exist.
-D	The displayed content is similar to the case when no options are specified, but differs in that it contains device names.	Allows you to check the driver necessary for Oracle Solaris to enable the device, or to view a list of drivers to be used.
-p	The displayed content is similar to the case when no options are specified, but differs in that the display is simpler.	Allows you to view the devices as a simple list.
-V	Displays the version and date of the OpenBoot PROM firmware.	Allows you to quickly check the firmware version.

The following example shows the output from the prtconf(1M) command.

```
# prtconf
System Configuration:  Oracle Corporation  sun4v
Memory size: 131304 Megabytes
System Peripherals (Software Nodes):

ORCL,SPARC64-X
    scsi_vhci, instance #0
    packages (driver not attached)
        SUNW,builtin-drivers (driver not attached)
        SUNW,probe-error-handler (driver not attached)
        deblocker (driver not attached)
        disk-label (driver not attached)
        terminal-emulator (driver not attached)
        dropins (driver not attached)
        SUNW,asr (driver not attached)
        kbd-translator (driver not attached)
```

```
        obp-tftp (driver not attached)
        zfs-file-system (driver not attached)
        hsfs-file-system (driver not attached)
    chosen (driver not attached)
    openprom (driver not attached)
        client-services (driver not attached)
    options, instance #0
    aliases (driver not attached)
    memory (driver not attached)
    virtual-memory (driver not attached)
    iscsi-hba (driver not attached)
        disk (driver not attached)
    virtual-devices, instance #0
        console, instance #0
        rtc (driver not attached)
        flashprom (driver not attached)
        console (driver not attached)
        channel-devices, instance #0
            virtual-channel, instance #0
            virtual-channel, instance #3
            virtual-console-concentrator, instance #0
            virtual-network-switch, instance #0
            virtual-disk-server, instance #0
            virtual-channel-client, instance #1
            virtual-channel-client, instance #2
            pciv-communication, instance #0
            virtual-domain-service, instance #0
    cpu (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
------------------------Omitted------------------------
    cpu (driver not attached)
    cpu (driver not attached)
    cpu (driver not attached)
    pci, instance #0
        pci, instance #0
            pci, instance #1
                pci, instance #2
                    scsi, instance #0
                        iport, instance #8
                            smp, instance #3
                            disk, instance #8
                            enclosure, instance #3
                        iport, instance #11
                pci, instance #3
                    pci, instance #5
                        usb, instance #0
                        usb, instance #0
                            hub, instance #0
                pci, instance #4
                    network, instance #0
                    network, instance #1
                pci, instance #6
```

```
                    network, instance #2
                    network, instance #3
    pci, instance #1
        pci, instance #7
            pci, instance #8
                pci, instance #9
                pci, instance #10
                pci, instance #11
    pci, instance #2
        pci, instance #12
            pci, instance #13
                pci, instance #14
                pci, instance #15
                pci, instance #16
                pci, instance #17
    pci, instance #3
        pci, instance #18
            pci, instance #19
                pci, instance #20
                pci, instance #21
                pci, instance #22
                pci, instance #23
    pci, instance #4
        pci, instance #24
            pci, instance #25
                pci, instance #26
                    scsi, instance #1
                        iport, instance #6
                            smp, instance #1
                            disk, instance #6
                            enclosure, instance #1
                        iport, instance #9
                pci, instance #27
                    pci, instance #29
                        usb, instance #1
                        usb, instance #1
                            hub, instance #2
                pci, instance #28
                    network, instance #4
                    network, instance #5
                pci, instance #30
                    network, instance #6
                    network, instance #7
-----------------------Omitted-------------------------
    pci, instance #22
        pci, instance #101
            pci, instance #102
                pci, instance #103
                pci, instance #104
    pci, instance #19
        pci, instance #105
    pci, instance #23
        pci, instance #106
            pci, instance #107
                pci, instance #108
```

```
                pci, instance #109
    pci-performance-counters, instance #0
    pci-performance-counters, instance #1
    pci-performance-counters, instance #2
    pci-performance-counters, instance #3
    pci-performance-counters, instance #4
    pci-performance-counters, instance #5
    pci-performance-counters, instance #6
    pci-performance-counters, instance #7
    pci-performance-counters, instance #8
    pci-performance-counters, instance #9
    pci-performance-counters, instance #10
    pci-performance-counters, instance #11
    pci-performance-counters, instance #12
    pci-performance-counters, instance #13
    pci-performance-counters, instance #14
    pci-performance-counters, instance #15
    pci-performance-counters, instance #16
    pci-performance-counters, instance #20
    pci-performance-counters, instance #17
    pci-performance-counters, instance #21
    pci-performance-counters, instance #18
    pci-performance-counters, instance #22
    pci-performance-counters, instance #19
    pci-performance-counters, instance #23
    ramdisk-root (driver not attached)
    os-io (driver not attached)
    fcoe, instance #0
    iscsi, instance #0
    pseudo, instance #0
#
```

C.4 netstat(1M) Command

The netstat(1M) command displays the network status and the protocol statistics. This command allows you to view a list of connections maintained by the host and their status. This command also allows you to check the IP, TCP, and UDP packet statistics and error conditions.

Table C-4 lists the options of the netstat(1M) command and how those options are useful for troubleshooting.

Table C-4 netstat(1M) command options

Option	Description	Application
-i	Displays the interface status. The displayed content includes information on incoming and outgoing packets, incoming and outgoing errors, collisions, and queues.	Allows you to view a concise overview of the network status.
-i interval	Specifying a numeric value after the -i option executes the netstat(1M) command at intervals of the specified number of seconds.	Identifies intermittent or long-term network events. You can view nighttime events at a glance by piping the netstat output to a file.
-p	Displays the media table.	Allows you to check the MAC addresses of the host on the subnetwork.
-r	Displays the routing table.	Allows you to check the routing information.
-n	Converts a host name into an IP address and then displays it.	Allows you to check the IP address instead of the host name.

The following example shows the output from the netstat(1M) command.

```
# netstat -p
Net to Media Table: IPv4
Device   IP Address               Mask      Flags      Phys Addr
------ -------------------- --------------- -------- ---------------
net0   4S-111-D0            255.255.255.255 SPLA     b0:99:28:98:30:36
net0   10.24.187.1          255.255.255.255          00:0a:b8:50:cd:42
net0   224.0.0.22           255.255.255.255 S        01:00:5e:00:00:16

Net to Media Table: IPv6
 If   Physical Address    Type      State       Destination/Mask
----- -----------------  ------- ------------ --------------------------
net0  33:33:00:00:00:01  other   REACHABLE    ff02::1
net0  33:33:00:00:00:02  other   REACHABLE    ff02::2
net0  33:33:00:01:00:02  other   REACHABLE    ff02::1:2
net0  33:33:00:00:00:16  other   REACHABLE    ff02::16
net0  b0:99:28:98:30:36  local   REACHABLE    fe80::b299:28ff:fe98:3036
net0  33:33:ff:98:30:36  other   REACHABLE    ff02::1:ff98:3036

#
```

C.5 ping(1M) Command

The ping(1M) command sends ICMP ECHO_REQUEST packets to the network hosts.

In certain configurations of the ping(1M) command, the command output allows you to identify a network link or a node that has experienced a problem. The destination host is specified by the variable: *hostname*.
Table C-5 lists the options of the ping(1M) command and how those options are useful for troubleshooting.

Table C-5 ping(1M) command options

Option	Description	Application
hostname	When you send a probe packet to *hostname*, a message is returned.	Allows you to confirm that a host is active on the network.
-g *hostname*	Forces the probe packet to go through the specified gateway.	Allows you to test the qualities of individual routes by sending packets to the target host via those routes.
-i *interface*	Specifies the interface to be used for sending and receiving a probe packet.	Allows you to easily check the secondary network interface.
-n	Converts a host name into an IP address and then displays it.	Allows you to check the IP address instead of the host name.
-s	ping is repeated at intervals of 1 second. Pressing the [Ctrl] + [C] keys stops ping, and then displays the statistics.	Allows you to check intermittent or long-term network events. Allows you to instantly view nighttime events by piping the ping output to a file.
-svR	Displays the routes that the probe packets pass through at intervals of 1 second.	Displays the routes and hop counts of probe packets, allowing you to compare multiple routes to identify any bottleneck.

The following example shows the output from the ping(1M) command.

```
# ping -s 10.24.187.50
PING 10.24.187.50: 56 data bytes
64 bytes from 10.24.187.50: icmp_seq=0. time=0.555 ms
64 bytes from 10.24.187.50: icmp_seq=1. time=0.400 ms
64 bytes from 10.24.187.50: icmp_seq=2. time=0.447 ms
^C
----10.24.187.50 PING Statistics----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms)  min/avg/max/stddev = 0.400/0.467/0.555/0.079
#
```

C.6 ps(1) Command

The ps(1) command displays a list of process statuses. When no options are specified, the command displays information on those processes that have the same execution user ID as the user executing the command and the same control terminal.
If you specify an option, output information is controlled by the option.
Table C-6 lists the options of the ps(1M) command and how those options are useful for troubleshooting.

Table C-6 ps(1) command options

Option	Description	Application
-e	Displays information on various processes.	Allows you to view the process IDs and files that can be executed.
-f	Generates a complete list.	Allows you to view process information such as the user ID, the parent process ID, the execution time, and the paths to the executed files.
-o *option*	Selects any items from those that can be configured as outputs. The pid, pcpu, pmem, and comm options display the process ID, CPU usage, memory usage, and the corresponding executable files, respectively.	Allows you to check only the most important information. By determining the resource usage rate, you can identify those processes that could potentially affect the system performance or even cause a hang up.

The following example shows the output from the ps(1M) command.

```
# ps -eo pcpu,pid,comm|sort -rn
%CPU   PID COMMAND
 0.0   674 sort
 0.0   673 ps
 0.0   637 -bash
 0.0   636 login
 0.0   634 /usr/sbin/in.telnetd
 0.0   629 -bash
 0.0   613 /usr/bin/login
 0.0   602 /usr/lib/devchassis/devchassisd
 0.0   600 /opt/SUNWldm/bin/ldmd
 0.0   581 /usr/lib/inet/in.ndpd
 0.0   580 /sbin/dhcpagent
 0.0   577 /usr/lib/rmvolmgr
 0.0   548 /usr/sbin/auditd
 0.0   519 /usr/sbin/syslogd
 0.0   508 /usr/lib/ssh/sshd
 0.0   497 /usr/lib/fm/fmd/fmd
 0.0   487 /usr/lib/hal/hald-addon-cpufreq
 0.0   472 /usr/lib/autofs/automountd
```

```
 0.0   470 /usr/lib/autofs/automountd
 0.0   468 /usr/lib/inet/inetd
 0.0   458 hald-runner
 0.0   453 /usr/lib/hal/hald
 0.0   450 /usr/sbin/rpcbind
 0.0   421 /usr/lib/inet/proftpd
 0.0   413 /usr/sbin/cron
 0.0   382 /lib/svc/method/iscsid
 0.0   369 /usr/lib/efcode/sparcv9/efdaemon
 0.0   332 /usr/sbin/nscd
 0.0   297 /usr/lib/picl/picld
 0.0   272 /lib/inet/nwamd
 0.0   179 /usr/lib/devfsadm/devfsadmd
 0.0   176 /usr/lib/zones/zonestatd
 0.0   171 /usr/lib/ldoms/drd
 0.0   164 /usr/lib/ldoms/ldmad
 0.0   161 /usr/lib/utmpd
 0.0   158 /usr/lib/dbus-daemon
 0.0   128 /usr/lib/sysevent/syseventd
 0.0   112 /usr/lib/pfexecd
 0.0    98 /lib/inet/in.mpathd
 0.0    74 /lib/crypto/kcfd
 0.0    73 /lib/inet/ipmgmtd
 0.0    59 /usr/sbin/dlmgmtd
 0.0    38 /lib/inet/netcfgd
 0.0    13 /lib/svc/bin/svc.configd
 0.0    11 /lib/svc/bin/svc.startd
 0.0     8 vmtasks
 0.0     7 intrd
 0.0     6 kmem_task
 0.0     5 zpool-rpool
 0.0     3 fsflush
 0.0     2 pageout
 0.0     1 /usr/sbin/init
 0.0     0 sched
#
```

C.7 prstat(1M) Command

The prstat(1M) command repeatedly tests all the active processes on the system, and provides statistics based on the specified output mode and sorting order. The output from the prstat(1M) command is similar to that from the ps(1M) command. Table C-7 lists the options of the prstat(1M) command and how those options are useful for troubleshooting.

Table C-7 prstat(1M) command options

Option	Description	Using the option
No options	Displays a list of processes sorted in descending order of CPU resource consumption. The list is restricted by the height of the terminal window and the number of processes. The output is automatically updated every 5 seconds, and is stopped by pressing the [Ctrl] + [C] keys.	The output allows you to view process IDs, the User IDs, memory usage, status, CPU usage, and command names.
-n *number*	Restricts the number of lines in the output.	Limits the amount of displayed data, so that you can identify those processes that are consuming excessive amounts of resources.
-s *key*	Sorts the list by key parameter.	The list can be sorted by cpu (default), time, and size.
-v	Displays the information in detailed mode.	Allows you to view other parameters.

The following example shows the output from the prstat(1M) command.

```
# prstat -n 5 -s size
   PID USERNAME  SIZE   RSS STATE   PRI NICE      TIME  CPU PROCESS/NLWP
   497 root       55M   49M sleep    59    0   0:01:12 0.0% fmd/37
   600 root       41M   36M sleep    59    0   0:09:13 0.0% ldmd/13
    11 root       37M   33M sleep    59    0   0:00:17 0.0% svc.startd/12
   468 root       24M   12M sleep    59    0   0:00:00 0.0% inetd/4
    13 root       20M   19M sleep    59    0   0:00:37 0.0% svc.configd/24
Total: 49 processes, 669 lwps, load averages: 0.05, 0.05, 0.04
#
```

Appendix D

External Interface Specifications

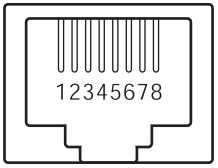
This appendix explains the specifications of the external interface connectors on the server.

- Serial Port
- USB Port
- SAS Port
- RESET switch

D.1 Serial Port

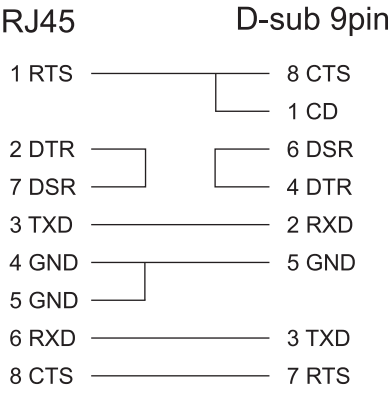
Table D-1 lists the specifications of the serial port.

Table D-1 Serial port

Pin arrangement	Pin number	Signal name	Input/output	Description
	1	RTS	Output	Transmission request
	2	DTR	Output	Data terminal ready
	3	TXD	Output	Transmitted data
	4	GND	---	Ground
	5	GND	---	Ground
	6	RXD	Input	Received data
	7	DSR	Input	Data set ready
	8	CTS	Input	Transmission possible

D.1.1 Wire connection chart of serial cable

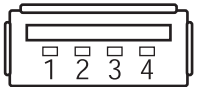
Figure D-1 Wire connection chart of serial cable



D.2 USB Port

Table D-2 lists the specifications of the USB port.

Table D-2 USB port

Pin arrangement	Pin number	Signal name	Input/output	Description
	1	VBUS	Output	Power supply
	2	-DATA	Input/ output	Data
	3	+DATA	Input/ output	Data
	4	GND	---	Ground

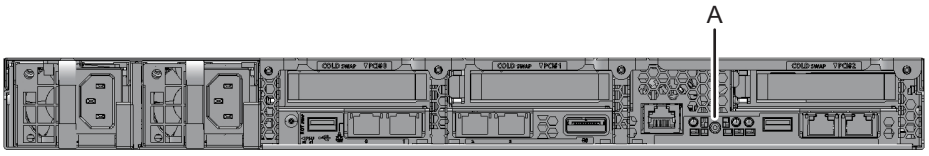
D.3 SAS Port

The SAS port is used to connect external devices with an SAS interface, such as a tape drive. The chassis has one SAS port on the rear side.
Contact our service engineer to determine which devices can be connected.

D.4 RESET switch

The RESET switch is an emergency switch to restart the XSCF. For how to use the RESET switch, see "17.2 Precautions concerning Using the RESET Switch" in the *Fujitsu M10/SPARC M10 Systems System Operation and Administration Guide*. Figure D-2 shows the position of the RESET switch. The RESET switch (A in the figure) is mounted on the rear side of the chassis.

Figure D-2 Position of the RESET switch



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